THE

HORTICULTURAL REGISTER,

AND

GENERAL MAGAZINE,

OF ALL

USEFUL & INTERESTING DISCOVERIES

CONNECTED WITH

NATURAL HISTORY AND RURAL SUBJECTS.

VOL. III.

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PREFACE.

This Third Volume being now completed, we beg again to return our best thanks to those friends who have used their endeavours to promote the general good, by making known the results of their experience in the different departments of Gardening, &c. and we have no doubt they have felt a secret pleasure in being able to add to the general fund of knowledge, and will continue to feel a greater and increasing pleasure, when, in their periodical calls on their fellow Gardeners, they see the hints they had dropped, acted upon with the success they desired.

Amongst other excellent papers in this volume, we may notice those on Chemistry, as connected with the Developement and Growth of Plants, by "the Author of the Domestic Gardener's Manual," which to young Gardeners and Amateurs in particular are of great importance, and to the experienced practical man they will not be without their value. The system of propagating Vines, by coiling the branches in pots, is cleverly advocated and explained by Mr. Mearns, whose well known abilities render his remarks doubly valuable, because they may be entirely depended upon. The mode of successfully growing Vines in Pots is again taken up by Mr. Stafford and others; this cannot be too much recommended, indeed we hope to see the day, when the Culture of Vines in Pots shall be generally adopted, not to the exclusion of those on the Rafters, but as auxiliaries to supply the table at seasons when it would be inconvenient or difficult to put those on the Rafters into action. A Classification of Garden Peas, including the height, qualities, season of use, &c. is given by Mr. Townsend, which, as a remembrancer to the experienced, and to assist in the instruction of the young Gardener, will be very useful. The system of Heating with Hot-Water is also explained at length, and Engravings given explanatory of the same, together with many other things of general utility.

Chatsworth, Nov. 24, 1834.

INTRODUCTION.

Many and great are the improvements of this aspiring age, and perhaps nothing has made more rapid strides or produced greater interest than gardening. This may be fairly inferred from the multitude of new publications on the subject which have appeared within the last few years, the avidity with which they have been purchased, and the evident improvement apparent in almost every garden, from that of the humblest Cottager to the most extensive of any Peer in the realm. Three hundred years ago, gardening in this country was of a very different description from what it is in the present day. The varieties of fruits were few, and greatly inferior to those which now occupy their places. Forcing was either wholly unknown, or it was accomplished by some of the most rude contrivances. Forcing plants, it is true, have been nurtured with great care, from time immemorial, but it is only within these few years, that they have become so conspicuous and ornamental in our conservatories, stoves, or borders. Besides, when we recollect what numbers are annually added to the original stock, it is easy to perceive that in a few years, these additions being continued, our present collections, splendid as they are, will appear but scanty and meagre. During the last year, nearly two hundred new introductions have been figured by the various botanical periodicals in course of publication, some of which are exceedingly beautiful. And vegetables, notwithstanding their value has been long acknowledged, are also *progressing*, for every year brings something new to our tables, surpassing in quality that which previously occupied its place. Nor is the operator now any longer contented with being a mere "digger and delver," for every one who makes any pretensions to the name of gardener, endeavours in some degree to search into nature's secrets. Their efforts are not now petrified by what was formerly considered "*fate,*" and consequently inevitable; they endeavour to trace effects to causes, and when any discoveries are made, they, through the medium of the press, communicate such results to their fellow-labourers in the same occupation, and thus the knowledge disseminated, makes thousands of what appeared insurmountable obstacles, sink into insignificance. Gardening, let it also be remembered, is so closely connected with

natural history, that to make any proficiency in the one, the student must, in some degree, become familiar with the other. Botany, for instance, is not now the same thing it was little more than two hundred years ago:—a mere recollection of the names or medical qualities of plants—it enters minutely into their structure, habit, and peculiarities, without a knowledge of which, many of our valuable introductions would soon be irrecoverably lost. When these are well understood, in connection with a knowledge of their native country, the cultivator has a pretty correct idea of the temperature they require, the soil in which they will best thrive, and the most proper mode of propagation. A gardener, however, should not stop here; if the nature of the food of plants be chemically considered, the constituents of soils and water, conclusions the most beneficial and interesting will be the result; indeed, a gardener should have recourse to science for every thing. Since the nature and habits of insects may now be studied with facility, they should by no means be lost sight of, particularly such as commit the greatest depredations in our orchards and gardens. It is too late now to sit down contented with the supposition that they are generated by an eastern or southern wind, and that therefore to prevent their ravages, is beyond the reach of human means.

All insects originate in parents, and the greater part come from eggs, which by an extraordinary instinct are deposited by the parents, when in the perfect state, upon the plants most suited for their future existence. These are generally called caterpillars or grubs, according as they possess or are destitute of legs. Caterpillars which have legs, feed, for the most part, upon leaves and fruits; grubs, or those without legs, attack the roots. It is an object of importance to the gardener, that he be able to distinguish, by the appearance of the eggs or caterpillars he sees, the nature and habits of the insect to which they belong. This will, doubtless, assist him greatly in the means he may adopt to destroy them effectually. Another class of depredators, are the mollusca, or different kinds of snails; some of these feed upon our choicest fruits, others upon the leaves of our most valuable plants, whilst others attack the roots; others again are totally inoffensive. To elucidate these subjects, and to spread general knowledge amongst all who delight in the occupation of gardening, we commence the third volume of the *Horticultural Register*, feeling assured, that our readers will enjoy a secret pleasure in disseminating the knowledge of every useful discovery they may make, and a still greater pleasure if they be the means of augmenting the happiness of human life.

THE

HORTICULTURAL REGISTER,

JANUARY 1ST, 1834.

PART I.

ORIGINAL COMMUNICATIONS.

HORTICULTURE.—ARTICLE I.

ON CHEMISTRY, AS CONNECTED WITH THE DEVELOPEMENT AND GROWTH OF PLANTS.

By the Author of the Domestic Gardeners' Manual.

I MIGHT, perhaps, be acting more in conformity with custom and routine, were I to enter, at once into the investigation of Earths and Soils. These are the supporters of almost every individual subject of the vegetable kingdom, they form the matrix wherein the embryos of life are developed, and in which the materials of terrene nutriment are so laborated and distributed as to supply the advancing radicles with appropriate food. Again, they are substances upon which the art of the chemist has been legitimately exerted; and whose nature and components he has, by experiments and analysis, pretty accurately determined.

But I greatly prefer postponing the enquiry into the constitution and offices of the earths, until I have excited the reader's attention to those mighty natural agents which are constantly at work, night and day, and during every moment of the existence of the vegetable vital being. These agents are Water, Air, and Light; the last is perhaps the most directly influential, but the first, I conceive, has a prior claim to consideration, in as much as in all probability it stands before the others in the order of creation. I shall therefore make the subject of this paper, an enquiry into the nature and agency of WATER.—How trifling a period of time has elapsed since water

was believed to be a pure, simple, uncompounded element; and yet its decomposition and re-formation have been going on without interruption or cessation throughout nature, ever since the developement of the first ray of light. The compound nature of water was determined beyond a doubt, by several philosophers, about the year 1781, when the immortal Lavoisier detailed his discovery, in the Memoires of the French academy.

A series of experiments, analytical as well as synthetical, were decisive, not only of the real components of the fluid, but of the proportions, by weight and measure, almost to exactitude, in which they unite to produce it.

By *Analysis*, from two greek words, *ανα* and *λυσις*, (a dissolution of, or bringing any substance or thing back to its first principles,) chemists express those processes which separate and repeal the parts or components of bodies; and by *Synthesis*, from *συν* and *θεσις*, a placing or bringing close together, they designate the re-uniting of the parts or constituents separated by analysis, so as to re-produce or form afresh the original substance that had been operated upon.

I shall not multiply chemical authorities, but confine my quotations chiefly to the elements of Lavoisier, that great father of modern chemistry; who, though doubtless in error upon some points, may safely be ranked with Newton, Boyle, or Linnæus. What they were in philosophy and botany, Lavoisier was in chemistry, for he laid the foundation of all the new and brilliant discoveries which have added lustre to the present century.

The first analytic experiment that led to a decisive result is described in the 137th page of the first volume of the edition of 1802. It may thus be abbreviated; for I cannot pretend to refer to the detail of the plates and machinery, figured and described. The reader is earnestly requested to obtain a view of the work itself.

A glass tube was fixed across a furnace for holding ignited charcoal; a slight inclination was given to the tube; and to the superior extremity of the tube, was fixed by lute, a glass retort, containing a determinate quantity of distilled water. Into the tube, twenty-eight grains of charcoal, broken into smallish pieces, and which had previously been exposed for a long time to a red heat in a close vessel, were introduced. To the inferior extremity, a worm (or spiral pipe of a still,) was firmly fastened and luted. This worm was adapted to a doubly tubulated bottle; to one tubulure or orifice of which, another bent tube was fixed in such a manner as to convey any aëriform fluids or gases that might be disengaged into a proper apparatus for determining their quantity and nature.

Things being thus arranged, and every precaution to obtain accuracy observed, the charcoal in the furnace was lighted, and such a fire maintained in another furnace under the retort, as sufficed to keep the water therein contained, continually boiling, and thus to force the steam into the tube that passed through the burning charcoal. "After the operation, we find," says Lavoisier,—"nothing but a few atoms of ashes remaining in the tube, the 28 grains of charcoal having entirely disappeared."

The products of the experiment were two gases, of a nature totally different from one another. The charcoal, situated as it was,—that is—within the glass tube surrounded by fire, had decomposed the aqueous vapor which was conveyed through it; and uniting with one of the constituents of the vapor, passed into a receiver, and was found to consist of 144 cubical inches of carbonic acid gas, weighing 100 grains. This heavy gas had before been proved to be composed of carbon and oxygen; therefore, oxygen was found to be one of the constituents of water.

The other gas was observed to take fire, "when in contact with the air, by the approach of a lighted body;"—it occupied 380 cubical inches, but weighing only thirteen and seven-tenths grains. This was found to be hydrogen gas, and therefore, it was determined that water was composed of oxygen and hydrogen. The water expended in steam was eighty-five and seven-tenths grains: it had been proved by preceding experiments that, carbonic acid contained seventy-two grains of oxygen in every one hundred grains; therefore, as the carbonic acid gas produced (being one hundred grains), had taken seventy-two grains from the water,—and as the hydrogen gas weighed thirteen and seven-tenths grains, the eighty-five and seven-tenths grains of water evaporated from the retort were accounted for, and the important chemical fact established that eighty-five and seven-tenths grains of water "are composed of seventy-two grains of oxygen, combined with thirteen and seven-tenths grains of a gas susceptible of combustion." This gas was subsequently named hydrogen gas, for the reason assigned in the introductory article, page 436, Vol. II. of the *Horticultural Register.* In the present state of widely diffused chemical knowledge, it will scarcely be needful for me to state that a variety of experiments by Lavoisier and his contemporaries, and by numberless chemists since his decease,—wherein many different substances were made to act upon water, have proved, beyond a doubt, that the analyses of the fluid have invariably led to the same conclusion. It was also found that electricity excited by the common machine, was capable of separating the two

constituents; and the decomposition of water by voltaic or galvanic electricity forms one of the most beautiful and decisive proofs of its compound nature, and also of the general correctness of Lavoisier's deductions. If any doubt could by possibility have remained, it was removed by the converse of these experiments; that is, by the re-combination of the constituents, and the reproduction of the fluid "element." I shall quote the substance of one of the most simple, and yet striking operations, the accuracy of which I can vouch, by the result of mine own experience.

Into a large crystal balloon, or globular glass, a certain given portion of carefully purified oxygen gas was admitted. A reservoir of the same purified gas was also at hand, from which the balloon might be re-supplied. This vessel was exhausted of its air, by an air pump, previously to the admission of the oxygen gas; and finally, by means of pressure, a small stream of hydrogen gas was made to pass into the balloon, which gas was immediately ignited by an electric spark. As the combustion proceeded, globules of water were deposited upon the inner surface of the globe, and these, enlarging into drops, ran down to the bottom of the vessel. I refer the reader to vol. I., page 144 of Lavoisier's Elements, for the particulars; suffice it to say—that it required eighty-five parts by weight of oxygen, united to fifteen parts of hydrogen, to compose one hundred parts of water. "We exerted" says the philosopher—"on that occasion, the most scrupulous attention to accuracy; and have reason to believe that the above proportions cannot vary a two hundredth part from absolute truth."

The compound decomposable nature of water cannot be a question of doubt; the nature also, and proportion of its elements are understood, as far as our limited knowledge will authorise this assertion; but there are depths and mysteries in all these phænomena which are at present unfathomable and incomprehensible. How are the two gases held in union, and condensed into the form of liquid? By the abstraction, say the chemists, of their gaseous caloric which had previously kept them in a state of minute division! But can this be the fact? It is true that in the slow combustion of hydrogen, in an atmosphere of oxygen gas, a great volume of heat is developed; and in the case of the rapid combustion of a certain volume of the two gases blended together, a most violent explosion takes place. But then, light, as well as heat, is manifested, and what is light? How is that produced from two invisible, aëriform fluids, unless it previously exist therein.

I shall not here anticipate what I must refer to at large in a future paper. I shall only observe that, in order to produce light, heat,

and water, from the union of the two gases, the electric spark, or actual fire must be applied to them; otherwise, as I have seen, the gases may be blended in a vessel, and become wholly inactive and uninflammable, in a very short space of time.

The facts already ascertained lead to the following conclusions:

First. Water, by a variety of agencies can be decomposed; it can also be re-produced by the re-union and deflagration of the two actual products of the previous decomposition, and that, to a nice degree of accuracy in respect to quantities and calculation; of these facts there is no question or doubt whatsoever.

Second. As analysis and synthesis tend to establish the nature of water, the proofs deduced from the experiment are irrefragable and decisive: the theory is therefore legitimate and not to be impugned.

Third. Though we can trace effects, we are still lost as to causes. One point however, is pretty nearly confirmed, namely, the universality of the distribution of light, of that all-pervading body, fluid, or essence, which is the source of that manifestation which chemists style caloric. To it we must look for the solution of all those mighty phænomena which astonish the mind when it dwells upon the multiform transitions of water and its elements, when it reflects that, the bland, cooling fluid, which forms the basis of so many of our enjoyments, may be modified into steam, a floating vapour, rather lighter than air, or congealed into a solid mass of rock, hard as adamant, and equally capable of emitting flashes of etherial fire. Again, that this fluid, which, properly applied, will extinguish fire and flame, may, with the utmost facility, be converted into gases capable of producing combustion, the light of which, shall vie with that of the sun; while the heat shall surpass in intensity, any that the uninformed human mind could have the faintest conception of.*

I must now hasten to the consideration of the agency exerted by water in the processes of vegetable growth and developement. This must be most important, for it is impossible that a body so susceptible of decomposition, and whose elements are endowed with powers of such extraordinary energy, could remain torpid or inactive. But one experiment of analysis remains to be noticed, because it will tend to introduce the subject of the agency mutally exerted between plants and water, and also to prove that the decomposition of that

* I herein allude to the combination of oxygen and hydrogen gases, when brought into action by the blow-pipe. Thereby the combustion of lime is effected, accompanied by the most astounding splendour; and by the same machinery, under other circumstances, a degree of heat is produced of unequalled intensity.

the year 1826, I made the site about one sixth burnt soil, and this gave me every satisfaction as to improvement, from its producing a crop. But by way of correcting, I could not perceive the least symptoms, nor was there scarcely a particle of the ashes to be found in it at the end of twelve months. I afterwards reversed the two matters, but still found the original to be troublesome, which induced me to leave it out altogether. But this part must be left to the judgment of the gardener or person employed, according to the nature of his soil. I wish to be understood, not only as treating upon it for correcting, but as one of the best improvements that can be used, and hence the practice of it is of more importance. I have tried it in many instances instead of dung, and never found it to fail. The advantage in quality over our clay, when burned, so far as I am able to judge from my own experience, is in a six fold degree. I have some that has borne several good crops of vegetables without any improvement, and it seems little exhausted. I made one plot eighteen months back, and immediately sowed it with onions which did well. In autumn, after I had got them off, I planted it with cauliflowers, cabbage and lettuce, to stand through the winter, all of which I think were as early and as good as could be produced in a similar situation. The cabbage I commenced cutting in the beginning of April, and the cauliflowers in the middle of the same month, not having the least protection during any part of winter; whereas had I planted the latter on the original soil in the same situation, though the winter was so favourable, they would have perished completely from cold and wet. Any kind of roots such as potatoes, turnips, &c, particularly radishes, grown in the vegetable ashes, will be found superior in flavour to what are grown in most other sorts of soil. Health being one of the greatest blessings bestowed upon us in this world, it should be carefully preserved. Now I scarcely know any thing more noxious about premises than a heap of vegetable matter, lying for months in a state of fermentation; it impregnates the atmosphere, and the air in a certain degree becomes impure all round. I object to the fermentation of vegetable matter for two reasons. First, that before it becomes thoroughly decayed, and fit for use, it is one of the finest nurseries for the breed of all kinds of insects, which ought to be guarded against. And Secondly, when thoroughly decayed, (they may be an improvement) but they only tend to fill the gardens with weeds which are completely obviated by my system. With regard to the burning of clay, as a corrector, it is certainly the best method that can be recommended. Its good or bad qualities, in a great measure, depend on its nature before it is burned, and as I am a com-

plete stranger to chemistry, I cannot pretend in the least to say of what our's is composed. If the top spit be laid aside, as for embankments, with the intention of being mixed with the two spits burned below, in a few years it will be a little more pliable than it was in its original state; whereas burning altogether answers well, but I can never afterwards obtain more than one good crop of vegetables without manure. In wet seasons, it will be found rather a troublesome matter to burn, but the best method is to get a tolerable quantity of wood together, in a manner similar to that of Mr. Stafford for burning clay, and then to cover it up about eighteen inches thick with the vegetable matter. Then I always light it the first thing in the morning, as it will require regular attention during the day, to prevent the fuel from burning away more in some parts than in others. The next morning, though the heap will be considerably sunk, the matter will be little wasted. The steam and vapour arising from it, will, in a great measure, have subsided, and the matter being raked together must be opened with a dung hook, and thrown together again; after which it will begin to waste, and will require little attention, except putting on a little fuel and more matter till the whole is reduced to ashes. Sometimes the heap is on fire for two months, when there is much rubbish to be cleared away, and burns better at first than when it is fomented. When I am deficient of wood, I use a little slack, but it must be used with discretion, or more may be used than is necessary. Where wood cannot be readily obtained, slack may be applied with advantage, in burning clay, as it will not materially alter its nature if used with moderation; being used too much it becomes brick dust.

P. S. The great advantage derived from clay burnt by Mr. Stafford depends, as I have observed, upon its quality before it is burnt, his clay, containing a larger portion of lime than that of these gardens, which naturally have little or none, requires for its improvement very different treatment.

Allestree Gardens, December 1, 1833.

ARTICLE III.—ON GROWING CUCUMBERS.

BY MR. J. BROWN, JUN.

THE culture of the cucumber has for years been a stimulant to practical gardeners, to excel each other in producing the fruit at an early season, yet always grown in dung pits and boxes; but of late years a more simple method has been devised, owing to the necessity of

growing them all the year; that is, growing them in the pine-stoves. This system, though not so congenial to the growth of the cucumber, may, in the depth of winter, be found more successful than the usual method, and it has been practised for many years, though I believe but to a very limited extent. It was the prevailing opinion, that they could not be brought to perfection, owing to the dry and heat they were subject to in the stoves.

Then it is desirable to have cucumbers for table throughout the winter, the pine-stoves are the most proper places to grow them in, as the labour and expense are nothing comparatively speaking to what attends the pits or boxes, I mean to say in the months of December, January, February, for it is striving hard against the steam at that untimely season of the year.

The best sort of cucumber is undoubtedly the Syon-free bearer, for it so soon produces fruit, which is of great importance; as to those sorts which are longer coming into bearing, their vital energies are exhausted before they can produce fruit, owing to the dry ungenial heat in which they grow, and those kinds which fruit the quickest are the best adapted for the purpose, provided they are handsome fruit, and not of the very short prickly kinds.

The seed should be sown in August, and the plants will come into bearing in November. The pots should be placed on a shelf, about eighteen inches from the glass in the stove, as there is no necessity for making a seed bed at this time of the year. When the seed-leaves are nearly full grown, they should be potted, two plants in a forty-eight sized pot, and kept in the shade a couple of days, and then placed again on the shelf where they may remain till finally planted. They ought to be supplied freely with water, the shelf also ought to be placed under one of the moveable lights, if any, to admit air in fine weather. They may either be grown in boxes made for the purpose, or large pots. Boxes are the best when made about three feet long, eighteen inches deep, and twelve inches wide. In the low Calcutta houses, they should stand along the back curb of the pit. When the young plants have nearly filled the pots with roots, they should be planted out; the soil should not be so light as is generally used. To four barrowsful of fresh loam, add two of rotten dung, and one of vegetable mould, which should have been well mixed, and for some time exposed to the air. It should be sifted moderately fine, putting the sifting about three inches at the bottom of the boxes. The boxes should be brought into the house, filled with the compost, and remain till the soil is warmed before planting. If pots are used, two plants will be sufficient to be turned out with

the ball entire, or form plants for the boxes. The soil should not be pressed down, but as it settles, the roots will soon appear at the surface, when some more soil may be put over them. Water must be regularly supplied, as the surface of the mould becomes dry, which will very often happen when the plants are bearing. If the Syon-free bearer, they should not be stopped until they are twelve or eighteen inches high, as they will show fruit almost at every joint, and it is better to get the plants large, for if stopped too much when joining, the plants will not be so fine. They should likewise be often syringed with warm water, and when the external air is dry, the house ought to be steamed gently. This will often invigorate the plants very much. Great care should be taken in supporting the plants; trellises ought to be made to fit the boxes, but if not, sticks will answer the purpose. The shoots should be tied so as to admit the leaves to expand freely to the light, and not to be crowded; if they are, they must be secured in as neat a manner as possible, and not by any means take any from the plant, unless decayed, as it is very evident every leaf is necessary for the welfare of the plant which is growing in a climate not at all congenial to its nature. The fruit blossoms should be impregnated as they open, or the fruit will not set well. The fruit also is very apt to grow deformed, for it will only swell sometimes at the base of the fruit, or else get large at the end. When this is the case, a broad piece of bass-matting should be tied round the part, and the fruit will soon begin to grow at the other extremity. By the beginning of November, some of the strongest shoots should be laid into some forty-eight sized pots, for a succession to come in January and February. These will soon strike root, and should be planted the same as the others. By this method of cultivation, we are able to cut cucumber the year round, in the gardens at Stowe.

Stowe Gardens, Bucks, October 21st, 1833.

ARTICLE IV.—ON THE CULTURE OF CUCUMBERS.

BY J. K. S. P.

I BEG to offer a few remarks on the culture of the cucumber. The first step is to be taken in the latter end of September, or the beginning of October, which is to have a one light box cleared out, and put in some old tan, into which plunge your seed pots, and apply a good lining of fresh horse-dung to your box. When the heat is up, sow your seeds, and put them into the box. In the course of a few days,

the plants will be up, and will soon require to be potted off in small pots, three in a pot. When this is done, replunge them into the box, and give a gentle watering, if the weather be fine, not forgetting to shade them from the sun, if required. Attention must be paid to keep up the heat in your lining, and by regulating the air, the plants having soon made their third leaf, it will be necessary to stop. The plants will break afresh and become stockey, proper attention being paid to them. In the course of a fortnight, they will require another place. It will be necessary to have a three light frame for them; I should recommend one on Mc.' Phail's plan, which is well known to all gardeners, for early forcing. It will now be requisite to clean out from the frame all the soil and dung, and to put some half exhausted dung, from a lining that is at work, into your frame. Fill up the pit level with the flues, and put a thin covering of cinder-ashes over it. Examine your frame all round to see that there is no place to admit any foul steam arising from the lining, which in all probability would destroy your plants. The mould is what must now be thought of, and a composition must be mixed up consisting of two parts of good sandy loam, one-half of rotten dung, and a third part peat. These being mixed well together, you must put a quantity into your frame, and make up the hills about eight inches from the glass, putting a good lining of fresh horse-dung to your frame, and then the heat will soon be up to receive the plants. After the plants are ridged out, the greatest attention must be paid to the regulation of heat, the giving of air, watering and renewing of the lining, so as to keep the temperature at 80 degrees of heat. Giving air at night must not be forgotten, air must be given at all opportunities. The covering which is put on at night will be regulated according to the state of your lining, great care being taken, in performing this part of the work; to examine your frame, and see there are no loose straws left hanging over the side; for if such be left they conduct the foul steam into the frame, and will not unlikely destroy your plants. The covering must be taken off in the morning, as early as the weather will admit, and the glass must be kept perfectly clean, to afford all the light to the plants, since light is life to them at this dull season of the year. In adding fresh mould to your plants, it should be done on a fine day, and as quickly as possible. The air at this season of the year is very cutting. In the month of January, your plants will be getting fruitful, and if they have received proper attention, fruit may soon be sent to table.

November 28th, 1833.

ARTICLE V.—PLEASURES OF GARDENING.

As Gardening has been the inclination of Kings, and the choice of philosophers, so it has been the favorite of public and private men; a pleasure of the greatest, and the care of the meanest, and indeed an employment and profession for which no man is too high or too low. The interest which flowers have excited in the breast of man, from the earliest ages to the present day, has never been confined to any particular class of society or quarter of the globe. Nature seems to have distributed them over the whole world, to serve as a medicine to the mind, to give cheerfulness to the earth, and to furnish agreeable sensations to its inhabitants. The savage of the forest, in the joy of his heart binds his brow with the native flowers of the woods, whilst a taste for their cultivation increases in every country in proportion as the blessings of civilization extend. Love for a garden has powerful influence in attracting men to their homes; and, on this account, every encouragement given to increase a taste for ornamental gardening is additional security for domestic comfort and happiness. It is likewise a recreation which conduces materially to health, promotes civilization, and softens the manners and tempers of men. Flowers are, of all embellishments, the most beautiful, and of all created beings, man alone seems capable of deriving enjoyment from them. The love fort hem commences with infancy, it remains the delight of youth, increases with our years, and becomes the great ornament of our declining days. The infant no sooner walks than its first employment is to plant a flower in the earth, removing it ten times in an hour to wherever the sun seems to shine most favourably. The schoolboy in the care of his little plot of ground, is relieved of his studies, and loses the anxious thought of the home he has left. In manhood our attention is generally demanded by more active duties, or by more imperious, and perhaps less innocent occupations; but as age obliges us to retire from public life, the love of flowers and the delight of a garden, return to soothe the latter period of our life.

In their growth, from the first tender shoots which rise from the earth, through all the changes which they undergo to the period of their utmost perfection, he beholds the wonderful works of creative power; he views the bud as it swells, and looks into the expanded blossom, delights in its rich tints and fragrant smell, but above all, he feels a charm in contemplating movements and regulations before which all the combined ingenuity of man dwindles into nothingness.

If herbaceous plants require little pruning, but nevertheless, some-

thing in this way may be occasionally required on the same general principles as we see judicious'y applied to forest trees.

Superstitions with regard to the blossoming of Plants.—The Crocus was dedicated to St. Valentine, as it appears about the period of that Saint's day, which is regarded as peculiarly sacred to affection. St. Valentine is recorded to have been eminent for love and charity. One species of daisy appears about the time of St. Margaret's day; this is called in France La Belle Marguerite, and in England Herb Margaret.

The Crown Imperial blossoms in England about the 18th of March, the day of St. Edward, King of the West Saxony; nature thus, as was imagined, honouring the day with a royal flower.

The Cardamine or our Lady's flower, distinguished for its pure white, is dedicated to the Virgin Mary.

The St. John's wort blossoms near that Saint's day. The Scarlet Lychnis, called the great Candlestick or Candle, (*Candelabrum ingeros*) was supposed to be lighted up for St. John the Baptist, who was a burning and a shining light. The white Lily expands about the time of the *annunciation*, affording another coincidence of the blossoming of white flowers at the festivals consecrated to the mother of Christ. The roses of summer are said to fade about the period of St. Mary Magdalen's day.

The Passion Flower is said to blossom about Holy Rood day. Allusions to this day being frequently found among writers of former days, it is said that, according to the legends of the Romish Church, the cross on which our Saviour was crucified was discovered in the year 326, by Helena the mother of Constantine, who built a church on the spot where it lay. The word *Rood* signifies the cross, thus this day is the day of the Holy Cross.

Of the various agents by which vegetables are nourished, water is thought most important. Some plants grow and mature with their roots immersed in water, without any soil; most of the marine plants are of this description.

Atmospheric air is necessary to the health and vigour of plants; if a plant be placed under a glass into which no air can enter, it withers and dies.

Most plants are found by analysis to contain a certain portion of salts such as nitre, and muriate of soda (chloride of sodium) or common salt. It appears that the root absorbs therefrom the soil by which it is nourished.

No Plants can grow without some degree of heat, though some require a greater portion of it than others.

Plants may be made to grow without light, but they will not exhibit the verdure, or any of the properties of health. The atmosphere which is contaminated by the respiration of animals is restored to purity by the vegetation of plants; but secluded from light, vegetables are no longer capable of converting a portion of the fixed air to their use or of supplying the atmosphere with the oxygen on which its importance in supporting animal life chiefly depends. By the action of light, the carbon of the fixed air is interwoven with the texture of the plants. The aromatic plants, the clove, cinnamon, and the peruvian bark, all owe their chief excellencies to the intense light of the Equatorial regions.

Culture of Yellow Locust.—The Robinia pseudo-acacia, or Yellow Locust Tree, is superior to any other kind of wood for ship trunnels, mill cogs, and fence posts, as well as for various other purposes. Its culture is very easy and it may be propagated in great abundance, by sowing the seed in March or April, in a bed of good sandy loam, which is its favourite soil, and covering half an inch deep. Previous to sowing, put the seed in a basin, pour in scalding water, and let them stand all night; pick out such seeds as are swollen, and plant them immediately; next evening repeat the same process with such as have not swollen the first night, mix the whole and sow them; they will come up in the course of the following month numerously; for no seeds grow more freely, notwithstanding what some may say to the contrary. When a year old, transplant them out of the seed-bed into nursery-rows, four feet distant, and plant from plant one foot in the row. Having two or three years' growth in these rows, they may be planted successfully in any warm and tolerably rich sandy ground. They may also be propagated by suckers, which they throw up abundantly, especially if some of the wide extending roots be cut through with an axe. An acre of these trees, planted two feet distant each way, will contain 10,890, at three feet distant, 4840, and at four feet distant, 2722; and it is said that no appropriation of land is more lucrative than that devoted to this purpose. The three Thorned Acacia Seed (Gleditschia) should be prepared in the same manner.

FLORICULTURE.

ARTICLE VI.—CULTURE OF THUNBERGIA ALATA,

BY G. I. T.

As no one appears to have noticed the enquiry of "Nanto," volume II. page 474, concerning this beautiful ornament of the stove, green-house, conservatory, and parlour window, I shall attempt to solve his doubts, and put him *au fait* of successful practice. Early in the summer, I unexpectedly received a very small plant from a kind friend; it was merely enclosed in moss, and a loose portion of soil. Judging from the form of the roots, and the appearance of the loose soil, I planted it in a 60 sized pot, in a mixture of heath-mould, (not by any means good bog earth) half decayed leaves sifted, and sandy loam all in about equal quantities, and well blended. The plant was then placed on the shelf of a pine bark pit. The mould was kept just moist, and the plant took to it and began to grow immediately. Now, by referring to Loudon's Hortus Brittannicus, I find that Thunbergia alata grows in loamy peat, and is propagated by cuttings. The work further states, that it is a stove trainer, grows 4 feet high, flowers from May to September, and was brought from the East Indies in 1823. My plant shewed flower in a week or two, and ever since, it has been, with the exception of a week, in a parlour window, and at this moment has eight fully expanded blossoms upon it, During the week alluded to, it was out of flower; it had twined up a stick with one simple volute, nearly to the height of 3 feet; and opened a flower or two almost daily. It then became rather torpid, and I pinched off the leader, shifted it to a 48 size pot, in a soil rather more loamy, and with some decayed manure. Laterals were soon protruded, the stick was shortened to the more convenient length of two feet, and as the young shoots attained its summit, they were turned down, and suffered to twine or fasten as they could. The plant has now two entire volutes from the soil, and four or five subsidiary falling twiners. Two other shoots rise from the crown, and are three inches long; one is partially layered under the surface, and may take root at the first pair of leaves. When the plant resumed its growth, and again showed flower, it was taken out of the stove, and brought at once into the sitting room, where it has remained ever since, frequently exposed to the full current of the open window and door before eight o'clock in the morning; it is watered immediately when the surface soil appears dry, and has never flagged for an hour.

So much for the culture of this gem, which is the more valuable as it well endures the heat of 70 to 90 in the stove, or the changeable climate of a room. As to the propagation, I deem it a matter of almost no concern, much less of trouble. Take a 48 sized pot, place moss or chip draining an inch deep in the bottom, fill the pot nearly with a soil of equal parts, heath-mould, sandy-loam, and decayed vegetable soil; equal parts of these. With a little cylindrical stick, make as many holes, 2 inches deep in the soil, as there are cuttings to be planted. Take off these cuttings at and across a joint, say the third from the top, where the wood is firmish: remove the lowest pair of leaves at the bottom, but retain all the others, and, as a general principle, never remove a leaf that is, or can be left above ground. Things being thus prepared, pour as much silver sand into each hole as will let the cutting go down, till the next pair of leaves touch the surface; then fill the hole with the same sand; moisten the surface to fix the cuttings, and arrange them by gentle pressure, to admit of their being covered with a tumbler glass. Press the rim of this glass the tenth part of an inch into the soil, and then, if possible, plunge thr pot into a leaf or tan bed of 75 to 80 degrees.

I never knew a cutting to flag, or a leaf to drop till it had done its office, nor a plant to fail. I have dwelt at large on this simple subject, speaking much more of minutiæ than I have ever attended to in practice, because I wish ever to lay open the causes of all the natural effects that I am describing. A young beginner had always better be too precise than otherwise, since he then will become self-taught, and acquire definite ideas, while he attains certainty in practice. From these motives the worthy conductor, Nanto and other readers, will I trust excuse the prolixity of this detail.

ARTICLE VII.

ON THE CULTURE OF HYACINTHS,

BY E. ESBURY.

As I have not yet observed in the pages of the *Horticultural Register*, any detailed method of cultivating the Hyacinth, I send you an abbreviation of a paper on the subject, by the Honorable and Reverend William Herbert, (from the 4th volume of the Horticultural Transactions) which, as it contains an account of the Dutch method of management, and as the author is known to be a skilful cultivator of bulbous rooted plants, may be considered fully sufficient for the successful cultivation of these beautiful flowers in England.

The compost used at Haarlem, (the centre of Hyacinths in Holland) is rotten cow dung, rotten leaves, and fine sea sand. In making this compost, the Dutch gardeners prefer the leaves of elm, lime and birch, on account of their rotting more quickly than those of other trees. The cow dung which they use is also of a peculiar quality, being collected without any mixture of straw or other litter, in the winter, when the cattle are fed upon dry food. The cow dung and leaves must not be used till they are thoroughly decayed; the compost should then be mixed in the following proportions, viz. one sixth rotten leaves, two sixths pure sand, and three sixths rotten cow dung; and it should be allowed to be together some time, to ameliorate and incorporate, before it is used for the beds. This compost retains its qualities about six or seven years, but the Dutch avoid setting Hyacinths in it two years successively; nor do they set them in it the first season, as the fresh manure might be injurious to them. In the alternate years they plant Tulips, Narcissi, &c. The beds should be made about three feet in depth with the compost, and must not be trodden down hard, but, trenches being opened, the bulbs may be arranged, and then carefully covered from three to five inches deep. They should not be dibbled or pressed into the compost. A little pure sand placed round the bottoms of young bulbs is believed to prevent them from cankering. The later sorts may be placed nearest the surface, to make them flower earlier. If the situation is wet in winter, the beds may be raised six inches, or even more, above the level of the soil, to prevent the injury which the bulbs might receive from moisture; but if too much elevated they will suffer from draught. The Dutch cover their beds with dung in winter, to keep off the frost, but this appears unnecessary in our climate. When the leaves of Hyacinths begin to wither, the bulbs should if possible be pulled out of the bed by the hand, to avoid the danger of cutting them with a spade; the leaves should be cut off, and each bulb laid on its side, covering it lightly with the compost about two inches thick;—in this state they should be left about a month (but the tardy sorts are usually left longer and more lightly covered) and then taken up in dry weather, and exposed to the open air for some hours, but not to a powerful sun, which would be very injurious to them. They should after this be carefully examined, and the decayed parts of any bulbs which may have cankered, must be removed with a knife, for which purpose it will sometimes be necessary to cut deep, for if it is not done effectually, the whole bulb becomes diseased and infects others which may be near it. The bulbs should be placed in an airy storeroom about the end of June; they must not be suffered

to touch each other, and must be frequently looked over, in order to remove those which may shew fresh symptoms of decay, until November, the time for replanting. Old Tan, well decayed and pulverized, may be substituted in the compost above described, if leaves cannot be obtained; and when the compost has been in use for about six years, it will be necessary to renovate it by the addition of some fresh materials.

In the first number of the Register, you mention that you have had some sashes glazed on Curtis and Harrison's plan, and that you will report to your readers how it answers. I hope you will do so, and also that you will let us know how it has been found to answer in hothouses and greenhouses.

Sussex, November 13th, 1833.

ARBORICULTURE.

ARTICLE VIII.—PLANTING FOREST TREES,

BY JOHANNES O'NEATH.

The Larch.—The annual increase of this tree in circumference, at six feet from the ground, is one inch and a half, on an average of several years; and of Larches of different ages, from ten years to fifty, that is, provided they have been thinned and pruned annually. An acre of land, when planted with Larches, pays every year from twenty-four to twenty-seven years' growth, a rent, by the increase of the wood, of £3 5*s.*: what rent an acre of land would pay when the Larches were forty, fifty, or sixty years' old, cannot be accurately known, except by an actual admeasurement; but there is some reason for guessing, that it would at fifty years, for the first planting, pay a rent of £15 a year!

Planting Trees.—He who plants trees upon his paternal estate, thinning and pruning them judiciously, repays a debt to his posterity, which he owes to his ancestors. A gentleman whose lands were more extensive than fertile, used to plant one thousand trees, on the birth of every daughter, upon his waste ground, which were on an average worth £1 each, upon her coming to age; thus enabling him to give her a fortune of £1000 without any extraordinary economy on his part, the regular thinning of the trees every year, with barking, &c. paying off all the current expenses, besides yielding him a small rent for the land. In the year 1758, ninety-two Fir Trees were transplanted upon a piece of ground, about three quarters of an acre in extent. The land was waste and poor; no extra

expense was incurred, and no further attention was paid to the young trees. In 1813 they were cut down, and yielded ninety tons of timber, then worth £4 per ton, giving a round sum of £360, which was equal to a rent of £6 10*s*. during the intervening fifty-five years. Can a more convincing proof be given of the facility with which a man may secure a fortune for his grand-children?

It is in the family records of a nobleman, in a neighbouring country, that about a hundred years ago, seven acres of good corn land were planted with Acorns, and that the sale of the underwood paid as much as the rent of any seven acres in the district, and that when cut down, the timber sold for ten thousand pounds. It would be too much to recommend planting upon good lands that are fit for other kinds of culture, but of its propriety and the profit of it on hilly waste lands, there can be no doubt.

It may be a question as to what kinds of trees are likely to be most profitable, where profit is the only object? Much depends upon the nature of the soil. On dry lands, Larch gives the fairest prospect of profit, and what is of no little consequence, it has been found, that the land under Larch becomes a beautiful and useful herbage, where nothing that was profitable grew before they were planted. We deeply regret the great inattention evinced by all landed proprietors, to the growth of the oak. There was a time when our gentry vied in the cultivation of this tree, and when our woods were literally filled with it. Why should not the same laudable predilection now prevail amongst our affluent country gentlemen, especially when the superiority of the English oak to that of every other country is universally acknowledged?

In addition to the care of good planting and good forcing to preserve them, all the trees (as recommended in former papers) should be annually pruned and thinned, keeping the tops spiral and light. If neglected for two years together, great numbers of young trees will be injured, and even spoiled, for good saleable timber by heavy collateral branches; those should be taken off close to the parent stem or trunk, not all at once, so as to injure the appearance of the tree, but the largest and stoutest, beginning at the top, so as to improve the upright direction of it, give vigour to the leader, and make a larger proportion of straight timber. It is to be hoped that the valuable hints on this subject will not be lost.

NATURAL HISTORY.

ARTICLE IX.—ON THE STUDY OF BOTANY.

ON UMBELLATI FLOWERS.

BY F. F. ASHFORD.

FIGURE to yourselves, my youthful friends, a long stem, pretty straight, with leaves placed alternately upon it, generally cut fine, and embracing at their base, branches which grow from their axils. From the upper part of the stem as from a centre, grow several pedicles or rays, which, spreading circularly and regularly like the ribs of an umbrella, crown the stem with a kind of basin more or less open. Sometimes these rays leave a sort of void in the middle, and in that case are more exactly like the hollow of a basin. Sometimes also this middle is furnished with other rays that are shorter, which rising less obliquely, form with the others nearly the figure of a half sphere having the convex side uppermost.

Each of these rays is terminated, not by a flower, but by another set of smalier rays, crowning each of the former exactly as the first crown the stem.

Here then are two similar and successive ranks, one of large rays terminating the stem, another of smaller rays like the others, each of them terminating the great ones. The rays of the little umbels are no farther subdivided, but each of them is a pedicle or footstalk to a little flower.

If you can frame an idea of the figure I have just described, you will understand the dispositions of the flowers in the tribe of umbelliferous or umbellate plants.

Though this regular disposition of the fructification be striking, and sufficiently constant in all this tribe, it is not that, however, which constitutes the character of umbellate plants. This is derived from the structure of the flower itself.

The umbellate plants have a superior corolla of five petals, called regular, though frequently the two outmost petals of the flower at the extremity of the umbel are larger than the three others. The form of these petals varies in the different genera, but it is usually cordate or heart-shaped. They are very narrow next the germ, but gradually widen towards the end, which is emarginate or slightly notched, or else they finish in a point, which, being folded back, gives the petal the air of being emarginate.

Between each petal is a stamen, and the anther generally standing

out beyond the corolla, the five stamens are more visible than the five petals. I make no mention here of the calyx, because it is not very distinct in this tribe of nature.

From the centre of the flower arise two styles, each furnished with its stigma, and sufficiently apparent. These are permanent, or continue after the petals and stamens fall off, to crown the fruit.

The most usual figure of this fruit is an oblong oval; when ripe, it opens in the middle, and is divided into two naked seeds, fastened to the pedicle, which, with an art that merits our admiration, divides likewise into two, and keeps the seeds separately suspended till they fall.

This, then, is the proper character of the umbellate tribe. A superior corolla of five petals, five stamens, two styles upon a naked fruit, composed of two seeds growing together.

Whenever these characters are found united in one fructification, be sure that the plant is of this tribe, even though in other respects it should have nothing in its arrangement of the order before laid down. And if all this order should be found conformable to my description, but contradicted by an examination of the flower, be sure you are deceived. For instance, if you shou'd happen to walk out and find an elder in flower, I am almost certain that, at first sight, you will say, here is an umbellate plant. In looking at it, you will find a large or universal umbel, a small or partial umbel, little white flowers, a superior corolla and five stamens; it is certainly an umbellate plant, say you. But let us see and take a flower.

In the first place, instead of five petals, we find a corolla divided into five parts, but all of one piece. Now the flowers of umbellate plants are not monopetalous, but pentepatalous. There are five stamens, but you see no styles, and oftener three stigmas than two, and more frequently three seed than two. Now the umbellate plants have never more nor less than two stigmas or two seeds to a flower.

Lastly, the fruit of the elder is a soft berry, and that of the umbellate tribe dry and naked. The elder, then, is not an umbellate plant.

If you inspect with more accuracy the disposition of the flowers, you will see that the elder has only the structure of the umbellate tribe in appearance. For though the principal rays proceed from the same centre, the smaller ones are irregular, and the flowers are borne on a second subdivision. In short the whole has not that order and regularity which we find in the umbellate tribe. The arrangement of the flowers of the elder is called a cyme. Thus by making a blunder, we sometimes learn to inspect with more accuracy. We come to the sixth and last tribe of flowers.

COMPOUND FLOWERS.

Though there is still a great deal wanting to complete our ideas of the five former tribes of plants, and I have not always known how to adapt my descriptions to the understanding of our young botanists, I flatter myself that I have given such an idea of them as to render, after a few months,' herberization, the air, port, and habit, familiar to them, so that when they see a plant they may conjecture nearly whether it belong to one of these five tribes, and to which of them, provided always, that by an analysis of the fructification, they afterwards see whether they may not have been deceived in their conjecture. The umbellate plants may have thrown some embarrassment in the way, which, however, may be escaped by means of the hints subjoined to my descriptions. It is not the nomenclature of a parrot that I wish them to acquire, but a real science, and one of the most delightful possible. I go on, therefore, to our sixth tribe, before I take a more methodical road. It may perhaps embarrass as much, if not more than the last.

Take one of those little flowers commonly known as the daisy, (Bellis perenis.) Look at it well, for by its appearance, I am sure you will be surprised when I say that this flower, which is so small and delicate, is really composed of between two and three hundred other flowers, all of them perfect; that is having each its corolla, germ, pistil, stamens, and seed; in a word, as perfect as the flower of the lily. Every one of those leaves, which form a kind of crown to the flower, appearing like so many petals, is in reality so many true flowers, and every one of those tiny yellow things in the centre like stamens is a real flower. If your fingers were already exercised in botanical dissections, and armed with the necessary apparatus and plenty of patience, I might convince you of this.

Let us avoid all ambiguity as to the word flower, by calling it compound, and giving the name of floscules or florets to the component flowers, but let us not forget that each of these florets is a genuine flower. You have observed two kinds of flowers in the daisy, the yellow ones which occupy the middle of the flower, where we shall leave the name of florets, and the little white tongues or straps which surround them, and which we will call semi-florets. These two sorts of florets are combined in the compound flowers, in such a way as to divide the whole tribe into three distinct sections.

Section 1st,—Consisting of those which are entirely composed of semi-florets, both in the middle, which is called the disk, and circumference, called the ray or radius; these are called semi-flosculous

flowers, and the whole is always of one colour, generally yellow, as in the dandelion.

Section 2d,—Comprehends the flosculous flowers, or such as are composed of florets only ; these are generally of one flower, as in the everlasting flowers.

Section 3rd.—Called radiate, and composed of both of these, so arranged that the florets occupy the disk, and the semi-florets the ray, as in the daisy. To form an idea of a compound flower, let us take the common clover. Seeing so many little flowers assembled, we might be tempted to take the whole for a compound flower, but we should be mistaken, in supposing that an assemblage of many little flowers constitutes a compound one. Whereas one or two parts of the fructification must be common to them all, as in the compound flower, and as one will have its own separately, as in the clover, two parts are the calyx and recepticle. The group of flowers in the clover head seems at first to be placed upon a sort of calyx, but remove this a little and it will be seen, that it does not belong to the flower, but to the foliage, being fastened to the pedicle. So that this supposed compound flower is only an assemblage of papilionaceous flowers, each of which has its distinct calyx, and consequently it is an aggregate or capitate flower. This then is the most simple and natural decreption we can give of this numerous tribe, and the three sections into which it is divided. I now come to the structure of the fructification.

A Floret is a monopetalous flower, regular with the corolla divided into four or five parts, five filaments fastened to the tube of the corolla, united at top into a round little tube which surrounds the pistil, this tube being the anthera united circularly into one body. The pistil has the style generally longer than the floret, above which it rises through the tube formed by the anthers. It is most frequently terminated at top by a forked stigma, the two curling horns of which are very visible. The pistil does not rest upon the receptacle any more than the floret, but both upon the germ serving as a base, and grows and lengthens as the florets wither, becoming in time a longish seed, and remaining fastened to the receptacle till it is ripe. One of the most common forms of the calyx is the imbricate or tilled, or that which is made up of several rows of leaves, lying over each other like tiles on the roof of an house, as in the artichoke. The most essential part of a compound flower is the receptacle, upon which are placed, first the florets, and then the seeds, which succeed them. This part, which forms a disk of some extent, makes the centre of the calyx, as in the dandelion. The calyx is divided into several parts down to the base, that it may close, open again, and turn back, as it does during the progress of the fructification.

The structure of the semi-florets is the same as that of the florets, the stamens, pistil, and seeds are arranged in a similar manner, only that in the radiate flowers there are many genera in which the semi-florets of the ray are abortive, either because they have no pistils, or because those which they have are barren. In such cases, the flower seeds only are produced by those in the disk. To understand this class well, the flowers must be examined from before their expansion, to the maturation of the fruit, and in this succession, transformations and a chain of wonders will be seen, which will keep every sensible mind in continual admiration.

I now conclude upon this tribe of compounds, I tremble at having so long abused your patience by details. I knew not how to make them shorter. I dare not promise more discretion in my next, which will be on the different forms of the nectary. You deserve a garland for your patience, and for the perseverance with which you have condescended to follow me through these briars without being discouraged at their thorns.

ARTICLE X.

COLLECTIONS AND RECOLLECTIONS.

Horticulture of America.—The following is an extract of a letter received by Mr. Saul, of Lancaster, which he kindly forwarded to us for insertion. Dated Albany, New York, August 28, 1833:—

"I shall, in less than two months, have been here a year, and now begin to know something of the climate. You are, of course, aware that the winter is colder and the summer hotter than in England, the spring late and generally wet, and on this account we have no broccoli, or sprouts, as you have, all through winter and spring. The contrast is great as to vegetables, between New York and Liverpool, in April and May, and the advantage all on the side of Liverpool. I think that although some few vegetables are grown better here, as pumpkins, squashes, Indian corn, and climbing kidney beans, that the English climate suits vegetables better, to take the year round. As to flowers, here are great deficiencies, the ranunculus, the anemone and auricula, are not grown, as the climate does not suit them; the primrose will not bear the winter, an ordinary sort of polyanthus is grown; but I never saw a good one. Evergreens will not bear the winter, except Ralmais, a rhodorendron or two, and the American

arbor vitæ. Here is no furze or heath, no arbutus, no sweet bay, or laurel, or laurustinus, but snowdrops and crocuses bear the winter, hepaticas grow wild, also fine azaleas, some œnotherias, and at this time abundance of golden rod and Michaelmas daisy or aster. The apples excel, though many most wretched ones are grown, pears are not plentiful, but around Albany plums are most abundant, and some excellent gooseberries, but they do not answer, except in particular spots, currants do well, except the black, which are bad, no apricots or nectarines are seen, but peaches are sent hither from Jersey and Long Island. Potatoes round us are good, but no where equal to the best English kinds in flavour or produce per acre. Green ears of Indian corn are a favorite dish here which you cannot have in England. Some things are very cheap; many pine apples were brought for sale from the West Indies; and one day in June, I bought in Albany, ten for a dollar, or five pence each; common apples now are only worth six-pence a bushel, common plums, now going out of season, four shillings a bushel, fine gages, &c. have sold at sixteen shillings. I had some English apples and pears this spring which all lived, some sent me last November all died. Amongst others I lost of Hacon's pear, three trees. Some day I shall beg of you to send me one in the spring."

White Clover Harrowed into Grass Land.—It is my intention, says Mr. Calvert, in a letter to Sir R. Sutton, in 1794, in March or April next, to sow upon an acre of land, in the centre of a grass field, about fourteen lbs. of white clover seed. The close was well manured from the fold yard in November last, and has never yet been harrowed. After sowing and harrowing with a common harrow to scratch the soil a little, I mean to make it fine by means of a thorn harrow, and wait the result of my experiment, which is intended to show how far grass land may be improved without ploughing. Should I succeed, I shall have pleasure in communicating it to you.—*Nottingham, Surrey,* 1794.

Note.—I beg to ask, if you can give any information respecting the result of this or any similar experiment? I would also invite your opinion as to its practicability and probable success. It seems feasible.

Birch Plantations.—Birch is felling from November to March, though the sooner the better, as the sap rises early, and it bleeds excessively, if not cut before March. I let the twigging to the Beesom makers, at so much a bundle of four feet girth. They lie till March, when they are stacked like corn, and thatched. They must be dry before being stacked, or they will become mouldy. I cut out the

thafts or staves, and sell them by the thousand or hundred. The tree is sold to the brush makers, for brush heads, painters' brushes, brush handles, bannisters, spindles, distaffs, &c. or short pieces to clog-makers, for shoe-heel cutters, &c. The poles are sold by the score, or gross, according to the articles into which they are converted. The refuse goes to the bakers, or for family use. The nogging ends unconverted are brought home and burnt for coal, being the quickest and best burning fuel possible; never flying or sparkling at all. I used to raise a good deal from seed. I pared and burnt a piece of the worst land, sowed it with turnips, fed it off, and harrowed it well. I harrow the seed well in, any time before winter; which I prefer, as the plants will grow sooner and make greater progress by coming out of the grouud earlier, than if this business were delayed till spring. They will grow in great abundance, broad-cast like corn, and be a nursery for years; leaving sufficient at last for a plantation. The seed may be easily taken from bearing trees, by cutting the branches before it is quite ripe, in August, and may be thrashed out with a flail as corn; as soon as the branches dry a little, two strikes or bushels go to an acre.—*Nevelle's Letter to Sir G. Sutton.*

Preserving Bees in Winter.—Mr. Ethridge of Montrose, Pew, who keeps a considerable quantity of Bees, buried several of his hives in the ground, during the falls of last year. They were placed a sufficient depth to be out of the reach of frost, and in such a manner that the air could by no means penetrate, being first covered with straw, to about the thickness of ten inches, before being covered with mould as fig, 1., They were taken up in April, and the bees were found to be in good health. They had made use of no honey, as there appeared to be as much honey in the spring as when the hives were buried in the autumn.

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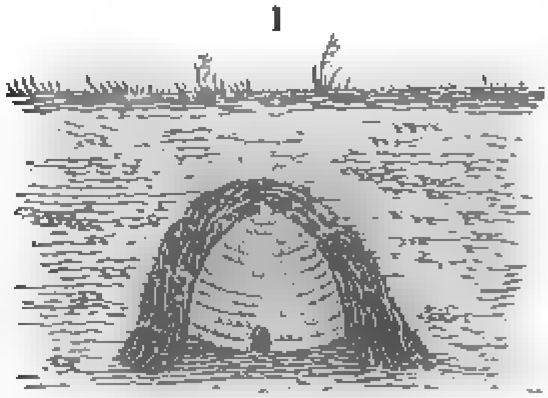

M. Saul.

Ling destroyed by Lime.—Lime is an utter enemy to ling or bent, so much so, to the former especially, that wherever even limestone unburnt is thrown down upon ling, in no great length of time the chippings of the stone, and the substance wasted off from them by rain, entirely destroy the ling and produce sweet herbage. In the Western Moorlands, where land over run with ling or bent is intended to be improved, it is the practice to lay on three or four chaldrons of lime per acre, which in one year entirely changes the natural produce to that of a fine turf full of white clover.

Culture of the Vine in America.—There are two varieties of the scuppernong grape, the black and the white, both possessing very similar qualities. The young wood is very slender, the leaves shining above and beneath, the fruit juicy and sweet. A wine of an excellent and peculiar flavour is made from these grapes. In North Carolina, many barrels are made in one season from a single vine. They are usually trained on arbours, over the large courts which separate the main portion of the houses from the kitchens, the latter being commonly placed behind in the rear. A single vine will soon cover a space of one hundred feet by forty, and bear as much as forty bushels of good grapes. The climate of New England is not well suited to the sort of grape; but in Carolina they are said to flourish, and their roots will find nourishment in dry sandy land, good for nothing else.

The numerous flourishing vineyards of America, which have of late years been established, in the middle, southern, and western States, for the manufacture of wines, consist chiefly of the native varieties, which are the Catawba, Isabella, Alexanders, Longhborough, Scuppernong, and Worthington. The wine of this last grape mixed with that of Schuylkill, gives it a degree of roughness between port and claret. The American sorts are found to do by far the best in American vineyards. It was found to be a capital error, in planting the European kinds in preference to their own. The American sorts require no protection during winter. The long canes produced in a single year, if left to themselves, would break and produce fruit only at their extremities, but this is remedied by art, which the cultivators about Boston perfectly understand, and where amazing crops are produced. Before vegetation commences, the rods of the former years' growth are tied in a coil. By this treatment the buds break and grow equally from the extremity to the base. When the buds have grown an inch or a little more, the rods are uncoiled and secured in their destined situations on the trellis. The practice of training vines in a serpentine or spiral manner is not new, but is too little known and too much neglected. M. Saul.

Reading Society at Lancaster.—A society is now being formed in this town, for taking in all the periodicals published in Britain and America; on gardening and botany, which I have no doubt will be of immense benefit. The expense will be trifling. It is fully expected, that the plans and arrangements will be completed so as to commence on the 2nd of January, 1834.

M. Saul.

PART II.

REVIEWS AND EXTRACTS.

REVIEW.

ALPHABET OF GARDENING,

By James Rennie, Esq. M. A. Professor of Zoology, King's College, London, And Author of the Alphabet of Botany.

Small 12mo, 128 pages, Price 2s. 6d.

In reviewing the Alphabets of Insects and Botany, in volume 1, pages 275, and 368, we expressed an opinion that they were both calculated to be very useful to persons unacquainted with the rudiments of either of those branches of science. On a careful examination of the present one, we have unavoidably arrived at the same conclusion. The author, within the small compass of 120 pages, treats on the Food of Garden Plants, including Garden Chemistry, Garden Physics, and Garden Physiology. Philosophy of Garden Processes and operations, including the Scientific Principles of manuring, digging, and raking, seed sowing, transplanting, striking, grafting, and budding, pruning, training, blooming, fruiting, multiplying and preserving, and lastly forcing. Under these several heads the most essential knowledge is supplied to the young gardener, not couched in abstruse language, but written in the most plain, and simple style. The scientific terms, however, are appended in notes, at the bottom of each page, where the explanation of them occurs. We furnish a few extracts, which will give our readers a tolerably correct idea of the style and character of the work. Under the head "Garden Physics," when speaking on the texture of soils, the author says,

"One of the best methods of ascertaining the capability of any soil to take up and retain moisture, is that described by Mr. C. Johnson, for which purpose he employs the following apparatus, fig. 2. *a* is a lamp; *b* a stool with a hole in the seat for receiving *c*, a shallow vessel, closely covered, but having a pipe, *d*, for the escape of steam; *h* is a pair of accurate scales. In order to employ this apparatus, put a small quantity of the soil to be tried on the top of the tin vessel, in which water is kept briskly boiling for half an hour, so as to roughly dry the soil by expelling its moisture. Take 10 grains accurately weighed of

this dried soil, and add to it, by means of a quill, a drop or two of pure water, if distilled water can be had, so much the better. Weigh the whole a second time, which will now be a few grains above ten. Take out the weight of the water from the scale, leaving in the weights of the dried soil, and suspend the beam, so that the scale c, may rest on the lid of the tin vessel, in which the water is still kept boiling: then with a stop watch note the exact time, which the added water takes to evaporate, as will be shown by the beam of the balance becoming level. Mr. Johnson found that soils requiring less than 25, or more than 50 minutes, to evaporate the added water, and bring the balance to a level, were always proportionably unproductive; the first from having too much flinty sand, and consequently no texture fitted for retaining water; and the second from

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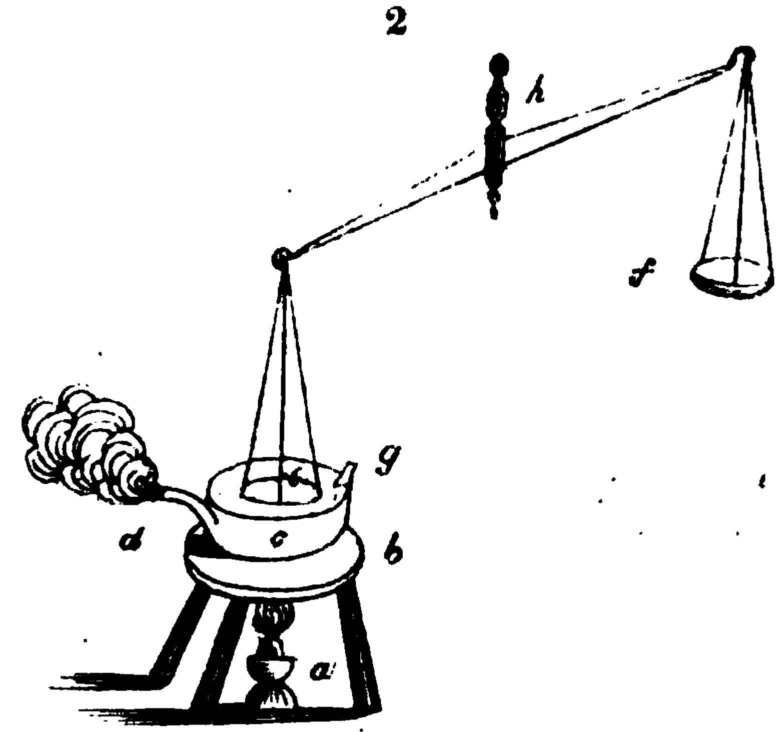

having too much clay, and consequently too few interstices to allow the water to escape. Rich soil, treated in this way, required thirty-two minutes to bring the beam to a level; chalk twenty-nine minutes: poor flinty soil twenty-three minutes, and gypsum only eighteen minutes.

A very fertile soil from Ormiston, Haddingtonshire, containing in 1000 parts, more than half of finely divided materials, among which were eleven parts of limestone soil, and nine parts of vegetable principles, when dried in a similar way, gained 18 grains in an hour, by exposure to moist air, at the heat of 62 degrees Fahr. while 1000 parts of a barren soil, from Bagshot Heath, gained only three grains in the same time.

Mr. Johnson farther found, that 100 parts of burnt clay, when exposed in a dry state for three hours to air saturated with moisture, at 68 degrees, took up 29 parts of water, that gypsum, in similar circumstances, took up only 9 parts, and chalk only 4 parts."

"Another method of testing the texture of soils is, by taking what is termed their specific gravity: that is, comparing what they weigh in air, with what they weigh in water. Sufficient accuracy for practical purposes may be obtained by drying two different soils at an equal distance from a fire, or in an oven, at the same time, and then weighing in the air a pound of each, in a thin bladder with a few holes near its top or neck. When the weight has thus been obtained in the air, the bladder may be put into water, letting it sink low enough to permit the water to enter through the holes into the neck, in order to mix with the dried specimen of the soil. The weight in water divided by the difference of the two

weights, will be the specific gravity, and the less this is, the greater will be the capacity of the soil to take up and retain water. Muschenbroett thus found rich garden soil to be 1630 compared to 1000 of water, and Fabroni found a barren sand to be 2210 compared to 1000 of water."

"Or fill a wide necked pint or quart bottle half full of water, and add the soil to be tried till the water rises to the brim. Then if the bottle can contain one pound of water, and gains half a pound additional when filled in this way, half with water and half with soil, the soil thus tried will be twice as heavy as water, and its specific gravity will be two. If it only gain a quarter of a pound, its specific gravity will only be one."

M. Giobert ascertained that a pound of fertile soil contained, of flinty sand, about 4400 grains, of clay, about 600 grains, of Lime about 400, besides 70 of water, and about 25 grains of inflammable materials, chiefly carbon. On a comparative trial of a barren soil, M. Giobert found that a pound weight contained about 3000 grains of flinty sand, about 600 grains of clay, about 400 grains of lime, and a little or no inflammable materials. M. Grisenthwaite directs an equal portion of two soils, perfectly dry, to be introduced into two tall glasses, in the midst of each of which a glass funnel has been previously placed. Fig. 3. The soils are to be put in so as to retain, as nearly as possible, their natural state when in the ground, and are consequently not to be too much pressed down. When this has been done, water is to be poured very gradually into each of the funnels, and it will rise up as it does in a piece of lump sugar, into the dry soil, as may be seen through the glass. The more rapidly the water is seen to rise, the better will be the texture of the soil.

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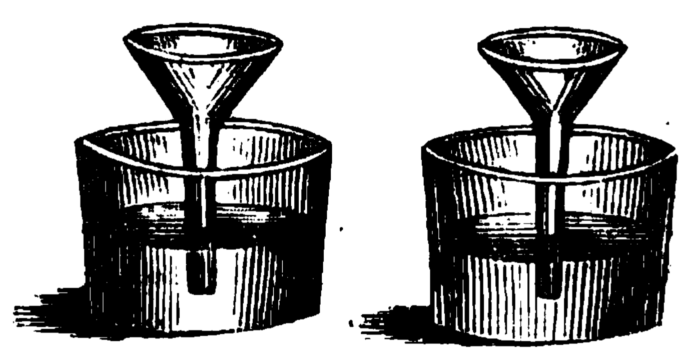

At page 53, when treating on the Principles of Manuring, we find the following observations: "As the chief food of plants consists of carbonic acid gas, and humic acid, mixed with water, it is clear that every sort of manure, whether it be simple or mixed with other substances in the form of compost, must be tried and judged, in the first place, by the proportion of carbonic acid gas, and humic acid, which it contains, or may evolve after it has been applied; and in the second by the quantity of water which it is able to take up and retain. This second test alone must not be trusted to, otherwise bog-earth, a very sterile substance in its undecomposed state, might be decided to be the best of all manures; nor will the first test always answer, otherwise chalk would appear to be an excellent manure; and so it might be under peculiar circumstances, and would be always if it could be brought to take up and retain enough of water to dissolve a portion of it, which it can only do by means of the humic acid. By using Mr. Johnson's apparatus, fig. 2, already described, the capacity of any manure to take up and retain water may be easily ascertained."

Composts.—It having been found, that the most fertile soils are those which contain a mixture of various ingredients, the conclusion was obvious, that soils artificially composed of the same or similar materials, would prove similarly fertile. This gave origin to the various compositions, termed composts, whose value, must of course be tried, like that of individual manures, by the leading tests of their proportional quantity of carbonic acid gas, and humid acid, and their capa-

bility of taking up and retaining water. Compost heaps must be managed on the general principles of chemistry already detailed, particular care being taken to guard against loss. Lime, for example, if mixed in a compost heap with rich old soil, or with rotten dung, will take up and render useless the carbonic acid gas which they contain, and can only be where there is much woody fibre difficult to be broken down. Bog earth mixed with fermenting dung, forms a good compost, as does also all vegetable refuse, such as weeds, young shoots of trees, and turf from hedge banks, or road sides."

EXTRACTS.

HORTICULTURAL INTELLIGENCE.

Experiments on Gases Hurtful to Vegetation.—Some plants of Euphorbium, Mercury, Groundsel, Cabbage, and Sow-thistle, with their roots, were placed, by Mr. Macaire, of Geneva, in the morning, in a large vase, into which chlorine of lime had been introduced. The roots were then separately soaked, and the quantity of chlorine disengaged was by no means sufficient to impair the vegetable tissue. At night, the plants had not suffered, and the smell of the chlorine was unchanged. The same plants, placed in the same vase, without any addition of chlorine, were found quite faded the next morning, after continuing all night, with the exception of the cabbage, which had resisted it. The odour of the chlorine had entirely escaped, and had been succeeded by a disagreeable acid smell. The experiment being several times repeated, by rendering the extrication of chlorine more considerable, produced the same result, and the plants supported an atmosphere strongly impregnated with chlorine by day, while a much weaker dose always destroyed them during the night.

Nitric Acid.—The experiment which was commenced at night, like the preceding, with vapours of Nitric Acid, exhibited the plants faded in the morning, but some leaves were wrinkled by the action of the acid. The same dose was tried by day, and although several leaves were wrinkled, the others were not at all withered.

Nitrous Acid Gas.—This gas appears to be a violent poison for plants, and a very small dose will kill them at night. By day, however, they do not appear to be sensibly affected, although the extrication of the gas may be abundant.

Sulphurated Hydrogen.—Precisely the same result. The plants were left at night in the same mixture of gases, which had not in the least changed them while in the light. They were all faded in the morning, and the gas absorbed; the cabbage alone resisting.

Muriatic Acid Gas.—The same results. The plants did not perish in the day, even when the quantity of gas was sufficient to wrinkle one or two leaves: they were quite dead in the morning, again leaving that particular odour already mentioned, excepting the cabbage. It appears by these trials, that many of the gases are hurtful to vegetation, but that they act on them only during the absence of light.—*Mag. Bot. and Gard.*

How far Marl contributes to the fertility of soils. 1st. Not materially, for it is devoid of every unctuous and saline matter. 2ndly. But instrumentally it

promotes vegetation, by attracting the moisture, acid, or oils in the atmosphere, which enrich the land. As this quality becomes stronger by burning, how wisely would the farmers act in using it after being calcined, on their grounds! It also appears, that the more frequently it is turned, the better effect it produces. It promotes vegetation, by destroying the acid actually in the land, or removing that which it might be in danger of imbibing from stagnating water; and hence, also, it may perhaps help to prevent a too acid disposition in the seeds. By dissolving every unctuous substance in the land, whence arises a saponaceous mixture soluble in water, and fitted to enter into the pores of vegetables. By destroying the toughness of strong soils, for, by its quickly crumbling in the air, the cohesion of a clayey soil is diminished, it is rendered easier to cultivate, and more fit to carry on the growth of plants. It gives greater solidity and firmness to loose or sandy soils: and, as before observed, it contributes to their fertility, by attracting into this dry soil the nutritive contents of the air. There are some who think that marl should not be laid on sandy soils; but experience has taught us to conclude otherwise, having observed that the most beneficial effects are produced from it on very light and sandy soils. Marl may hurt land by too long and a too plentiful use of it; for, from its calcareous quality, it much resembles lime. It soon dissolves and consumes the fat of the land—and it loosens a clayey soil so that it becomes less retentive of moisture. Marl is, however, very different according to its being more or less calcareous or clayey; and, therefore, judgement is more or less necessary to adapt it to the nature of the soil. Some have recommended it chiefly for wet and cold soils, and many farmers have observed, that it is most useful when mixed with rich manures. Neither of these observations, however, seems to be correct; but a due care should be taken that this operation be adapted to the soil on which it is laid.—*Count Gyllenborg.—Mag. Gard. and Bot.*

To Preserve Fruit for Exportation.—Suffer the fruit to hang on the tree to as late as possible in October, or till hard frosts have loosened the stalk, and they are in danger of being blown down by winds. They are then to be gathered from the tree by the hand, and carefully laid in baskets. New and tight well seasoned flour barrels are preferred. The baskets being filled in gathering should be cautiously lowered in the barrels and emptied. The barrels when filled are to be gently shaken, and the head carefully pressed down to its place, and secured. This pressure is necessary, as it prevents them rattling when moved. No straw or shavings should be placed at the ends, for it causes mustiness and decay. They should then be removed to the north side of a building, near to a cellar, protecting them from the sun and rain by a roof of boards, whilst they are exposed to the air on all sides. A chill does not injure them, but when the frost is severe, roll them into the cellar, which should be dry and airy. The barrels should never be tumbled or placed on the head. Apples keep best when grown in dry seasons, and on dry soils.—*American Orchadist.*

FLORICULTURAL INTELLIGENCE.

NEW AND VERY RARE PLANTS, figured in the Periodicals for November.

CLASS I.—PLANTS WITH TWO COTYLEDONES OR SEED-LEAVES.

SCROPHULARINÆ, or Figwort Tribe.

CALCEOLARIA SESSILIS, Sessile-leaved Calceolara.—This is a neat looking herbacious species, with a tendency to become shrubby, and is very beautiful when growing vigorously in the open border. Its habits are no doubt those of C. integrifolia, to which it is nearly related. It is a native of Valparaiso, where it was gathered by Mr. Mathers. The Hon. and Rev. Wm. Herbert also raised it from seeds collected by Mr. Cuming.—*Bot. Reg.* Culture.—All the herbaceous and half shrubby sorts appear to thrive best in a mixture of light loam, mixed with leaf mould and sand, and may be propagated by cuttings planted under a handglass, as well as by seeds, which should be sown as soon as ripe.

COMPOSITEÆ, or Compound Flowers.

CHAETANTHERA SERRATA, Tooth-leaved Chætanthera.—A perennial with yellow flowers. It has been very lately introduced from Chili, where it was found growing abundantly in sandy places, particularly in the Provinces of Conception, Rere, and Santiago. The plant is impatient of wet, and should be protected in a pit or frame, in winter; and may be increased by slips or seeds.—*Sweets Fl. Gard.*

POLYGALEÆ, or Milkwort Tribe.

POLYGALA THESIOIDES, Flax-leaved Milkwort.—A half shrubby plant, with blue flowers, a native of Valparaiso, in Chili, whence it was introduced last year, from seeds collected in that country by Mr. Hugh Cuming. It appears to delight in a sandy soil, is hardy, and may be increased by cuttings and seeds.—*Sweets Fl. Gard.*

OLEACEÆ, or Olive Tribe.

SYRINGA IOSIKÆA, Deep Flowered German Lilac.—A new species though less beautiful than the two in common cultivation, yet being equally hardy, cannot fail to be a most acceptable ornament to our gardens and shrubberies.—*Bot. Mag.*

ONAGRARIÆ, or Evening Primrose Tribe.

FUCHSIA GLOBOSA, Globe Flowered Fuchsia.—This has been lately introduced, probably from South America; but its history is unknown. It produces its brilliant flowers during the whole of summer, kept in a greenhouse with plenty of air. It appears to be more robust in its habits than most of the kinds, retaining its leaves better in winter. It will increase abundantly by cuttings, and grows well in rich garden soil.—*Bot. Cab.*

LEGUMINOSÆ, or Pea Tribe.

CALLISTACHYS RETUSA, Blunt-leaved Callistachys.—This is a native of New Holland; it has been lately introduced, and flowered with Messrs. Loddige in succession from June to August. It appears to grow to three or four feet in height, with a few strong branches, each producing a head of orange-coloured flowers. It requires the greenhouse or conservatory, and is readily propagated by cuttings. The soil should be loam and peat.—*Bot. Cab.*

THYMELEÆ, or Mezereum Tribe.

PIMELEA LONGIFLORA, Long-flowered Pimelea.—The vegetable inhabitants of New South Wales being in general readily cultivated in peat earth, and easily increased by cuttings, have been in great request for the greenhouse and conservatory; and among them are the different species of Pimelea. The present species was introduced to our gardens by Mr. Fraser, from the southern shores of New Holland, and is rendered beautiful by the comparatively large and globose heads of pure white blossoms terminating the white and wavy branches.—*Bot. Mag.*

ARTOCARPEÆ, The Bread-fruit Tribe.

FICUS ACUMINATE, Sharp-pointed Fig.—The genus of the figs is one of the most extensive among plants, chiefly inhabiting the tropics, many of the species constituting trees of gigantic growth, no less remarkable for their fructification than the sheathing stipules and milky juice, and bearing a great affinity to the Bread-fruit, (Artocarpus). Ficus elastica, and other species probably yield Caoutchouc; a few afford esculent fruits, chiefly the common cultivated fig, Ficus Carica, and the Sycamore of the Scriptures, F. Sycamorus, whilst the F. religiosa, Banyan Tree, or Sacred Fig of the Hindoos, is one of the many astonishing features of Indian vegetation. The present species bears an orange, tempting looking fruit, was introduced by Dr. Wallich from Silhet.—*Bot. Mag.*

CLASS 2nd.—PLANTS HAVING ONLY ONE COTYLEDON OR SEED-LEAF.

ORCHIDEÆ, or Orchis Tribe.

EPIDENDRUM ONCIDIOIDES, Oncidium flowered Epidendrum. A beautiful species, with flowers yellow and brown. It greatly resembles the Oncidium luridum, and has a most delicious and powerful fragrance. No doubt it is a native of some part of South America, but of what country in particular is uncertain. The flowers are very durable, remaining in perfection for at least a fortnight.—*Bot. Reg.*

LEPTOTES BICOLOR, Two-coloured Leptotes. Flowers crimson and white. The plant a native of the Organ Mountains of Brazil. Its habit seems to be to grow among broken potsherds, decayed vegetable matter, and moss.—*Bot. Reg.*

BLETIA GRACILIS, Slender Bletia. This is believed to be a native of Mexico. it is exceedingly slender in all its proportions. The leaves are of a purplish red colour, and the scape grows about a foot high, producing two or three flowers of a yellow colour, marked with crimson. It requires the stove, should be potted in vegetable earth and sandy peat, and will occasionally admit of increase by separating the bulbs.—*Bot. Cab.*

AMARYLLIDEÆ, The Narcissus Tribe.

HABRANTHUS MINIATUS, Red Habranthus. This species was introduced last year from Chili, by Mr. Hugh Cuming. It has flowers of a brilliant crimson, and requires a mixture of vegetable earth and sand, and will, like most bulbous plants from the same country, succeed well in the open air in a warm sheltered border.—*Sweets' Flower Gard.*

LIST OF NEW AND RARE PLANTS, in the Periodicals for December.

CLASS 1st.—PLANTS WHOSE SEEDS HAVE TWO COTYLEDONES. (DICOTYLEDONES.)

RAMINCULACEÆ, or Crow Foot Tribe.

ACONITUM STOERCKIANUM, Stoerck's Aconite. This is a hardy perennial plant, a native of Austria, and has been named after the celebrated physician, Baron von Stoerck. It produces purple flowers, and is a very showy plant. It may be increased by separating the roots, which are knobby, and it will grow in any good garden soil.—*Bot. Cab.*

GENTIANEÆ, or Gentian Tribe.

VILLARSIA CHILIENSIS, Chili Villarsia. This is a native of Chili, and has been very lately introduced. The flowers are yellow, and very pretty, opening a few at a time, in succession, each lasting but a little while. It will increase by separating the root, and should be potted in rich loam, with a pretty large allowance of water.—*Bot. Cab.*

CARYOPHYLLEÆ, or Chickweed Tribe.

LINUM CUMINGII, Cuming's Flax. This pretty little plant is a native of Chili; it was introduced in 1830, by Mr. Cuming. Its brilliant yellow flowers are produced nearly the whole of the summer. It requires the green-house, may be propagated by cuttings and seeds, and should be potted in light loam.—*Bot. Cab.*

LEGUMINOSÆ, or Pea Tribe.

LUPINUS INCANUS, Hoary Lupine. This handsome species is a native of South America, and was raised by Mr. Neill, from seed sent by Mr. Tweedie of Buenos Ayres. The whole plant has a silken appearance, the flowers are a pale lilac mixed with orange.—*Bot. Mag.* It requires the green-house, and may be potted in loam and peat.

ANTHILLIS WEBBIANA, Rose-coloured Kidney—Vetch, or Lady's Finger. This is a delicate and pretty plant. The whole herb is clothed with soft white silken hairs, on which, together with the rose coloured blossoms, it depends for its beauty. It is hardy, and should be cultivated in a dry soil.—*Bot. Mag.* It may be propagated by a division of the roots, and by seeds.

ERICEÆ, or Heath Tribe.

ANDROME'DA SALICIFOLIA, or Willow-leaved Andromeda. This little shrub is a native of the tropics, and not found in very elevated situations. It was first detected in the Mauritius by Commerson, and it is said to be plentiful in the woods of Belombre. The flowers are of a greenish hue. It needs the protection of a warm green-house. and should be cultivated in soil containing a considerable proportion of peat.—*Bot. Mag.*

MALVACEÆ, or Mallow Tribe.

NUTTA'LLIA PAPA'VER, Poppy-like Nuttallia. This species has been lately introduced by Mr. Drummond. It appears to be quite hardy, and is highly ornamental. The flowers are red purple and showy, and the whole plant has much the appearance of a poppy.

ASCLEPIADEÆ, or Swallow Wort Tribe.

MARSDE'NIA FLAVE'SCENS, Yellowish-flowered Marsdenia. For the discovery of this species, we are indebted to Mr. Allan Cunningham, who found it in New Holland.—*Bot. Mag.* It requires the stove, and should be potted in sandy loam, and may be increased by cuttings.

PASSIFLOREÆ; Passion-flower Tribe.

PASSIFLORA' KERMESINA, Crimson Passion-Flower. This is beyond all comparison the most beautiful species in cultivation, except P. racemosa. Its flowers have a richness of colour which art cannot imitate. They are produced at almost all seasons, in very great abundance; and in consequence of the length of the slender stalks from which they singly hang, the whole plant has a graceful aspect, unrivalled even among Passion-flowers. Mr. Lindley states that it is propagated with considerable difficulty, no part of the stem striking from cuttings except what is very woody and completely formed: and this which is always at the bottom of the stem, can scarcely be procured without cutting down the whole plant. It requires a hot and damp stove.—*Bot. Reg.* However, we had six cuttings in May last, which were not very woody. We planted these in sand, and plunged the pots in a little old tan, which produced no heat, placing them in a vinery, all of which have struck very freely and are now fine plants.

PASSIFLORA, gossypiifolia, Cotton-leaved Passion-flower. A native of the Tropical parts of America. It has been found by Dr. Hamilton, in the West Indies, and by Messrs. Deppe and Schiede, in Mexico. About Lima, in Peru, it seems to be common; from seeds collected in that quarter by Mr. Cruickshanks. It is not a plant of much interest, unless minutely examined, when the green stalked glands of the involucrum and leafstalks will be found beautiful objects. It is a perennial stove plant, multiplied by cuttings.—*Bot. Reg.*

GESNEREÆ.

GESN'ERA SUTTONI, Captain Sutton's Gesnera. This fine plant was sent to us by Captain Sutton, of His Majesty's packet establishment at Falmouth, who informs us that he found it growing in a wood, on a sloping hill, near the bay of Bomviaga, Rio de Janeiro. It has some resemblance to Gesnera bulbosa, but is evidently distinct from that species, differing from it in foliage as well as in the flowers, which are larger and have a broader outstretched upper lip. It requires the constant heat of the stove, and flourishes in a strong rich soil. It has not yet been increased; but there is no doubt, that cuttings will strike root without much difficulty.—*Bot. Reg.*

CLASS 2nd —PLANTS WHOSE SEEDS HAVE BUT ONE COTYLEDON. (MONOCOTYLEDONES.)

ORCHIDEÆ, or Orchis Tribe.

CIRRHAÆ WARRE'ANA, Warre's Cirrhæa. This is a native of Brazil; it was discovered by Mr. Warre. It bears a strong resemblance to the other species; they are all highly interesting and curious plants, well deserving every possible care in cultivation. It succeeds very well in the stove, planted in moss, with pots sherds and a little sandy peat soil. Like the rest, it will admit of occasional increase by dividing the bulbs.—*Bot. Cab.*

CYCNO'CHES LODDIGE'SII, Loddige's Cycnoches. This extraordinary plant is a native of Surinam; it was sent to Messrs. Loddige, in 1830, by Mr. Lance. It requires the stove, and may be suspended from a rafter, planted in moss and broken bits of pot.—*Bot. Cab.*

CYRTOCHILUM FLAVE'SCENS, Straw-coloured Cyrtochilum. This is a native of Mexico, whence it was imported by Mr. Tate, about three years ago. It is interesting, not only for its beauty, but also as being the first species of the genus

which has yet blossomed in Europe. It is a tender stove plant, growing upon a branch of a tree, or in a pot among decayed vegetable matter and potsherds. *Bot. Reg.*

IRIDEÆ, or Corn Flag Tribe.

LIB'ERTIA FORMO'SA, Handsome Libertia. This rare plant was found by Mr. James Anderson, in the Island of Chiloe, growing on the sea shore, within the reach of the waves. It is a half-hardy herbaceous plant, flowering in May, and is increased by dividing the root-stock. The flowers are white and fleshy, somewhat like wax.—*Bot. Reg.*

AROIDEÆ, or Arum Tribe.

ANTH'URIUM GR'ACILE, Slender Anthurium. This species is a native of the tropical parts of America. It has little beauty when in flower, but its spikes of crimson berries give it rather a pretty appearance when in fruit. It requires the heat of a stove, and a treatment similar to that of epiphytal orchideous plants.—*Bot. Reg.*

PART III.

MISCELLANEOUS INTELLIGENCE.

QUERIES AND ANSWERS.

VARIETY OF THE COMMON OAK AT CHATSWORTH.—It has been stated some-time ago in the Gardeners' Magazine, that at Chatsworth, standing in an open situation in front of the Mansion, is a variety of the common oak, the leaves of which are retained during great part of the winter. I shall be obliged by your stating whether any similar trees have been raised from it, and whether its acorns will produce the same variety. How would grafting answer?—C.C.C.C.

London, October 28th, 1833.

SIZES OF FLOWER-POTS.--It would be an assistance to some of your readers, who, like myself, are not very learned in the different matters relating to Horticulture, if when you are giving directions as to the size of flower-pots in your articles, you were to give the diameter and depth of those you recommend, rather than call them 48, 60, &c. I find these terms are not universally adopted at the various potteries in the country. A. Z.

BROWN ST. GERMAIN PEAR.—In the Encyclopædia of Gardening, a Brown St. Germain Pear is described. This is not mentioned either in Lindley's Guide or the London Horticultural Society's Catalogue. How comes it to pass? Will you or some of your readers explain? AN ENQUIRER.

RIPENING OF MELONS.—I have the green fleshed Keiseng, and Sweet Ispahan Melons; How near will they ripen together, when all growing in one frame? I want them all ripe at one time for the show. And how does the Melon called the "perfect Melon" agree in flavour with the above? A YOUNG GROWER.

RABBITS AND HARES.—How shall I protect Trees from them? Can any of

your correspondents favour me with a cheap and permanent method of protecting young trees from the bite of Rabbits and Hares? I have brushed the stems with Tar, and it seems to preserve them for a time. But the application appeared to me to have an injurious effect upon the trees.

In one of your earlier numbers, allusion was made to the formation of an Arboricultural Society. There can be little doubt that such a project would meet with encouragement, and be attended with much practical utility. J. F.

Schizanthus Hookeri, what is the culture of? Will you or any of your correspondents state in your valuable Register, the proper treatment of that beautiful flower the Schizanthus Hookeri? I had two plants this summer which seemed to do well, till they began to bloom, and then they died away.

P. S. Should like to know where to apply for a little seed. A Subscriber.

Culture of Variegated Laurel. What is the best method of cultivating and propagating the variegated (or Tiger) Laurel, Oleander, Rhododendron, Myrtle and Hydrangea? A Subscriber.

Mr. Howden's Journey into the North.—I hear that our neighbour, Mr. Howden, has been a journey into the North, and as, I think, such a person cannot return without bringing something in his "Napper," I should be glad, as well as most of your readers, to hear what he has seen. J. Plant.

American Blight. (Eriosomra Mali) Various plans have been adopted for destroying the American blight on fruit trees. I have found the following will destroy it, if applied as hereafter directed. Dissolve a sufficient quantity of gum arabic in sour ale (Alegar) to make the liquid thick as varnish. When this is made, take a painter's brush, and merely apply it to the parts affected.

M. Saul.

Hautboy Strawberries.—In Vol. 2, page 35, you state that at the London Horticultural Society, a paper was read "on the means of obtaining abundant autumnal crops of the double-bearing Hautbois Strawberry.—If you would state *the means* in detail, and the *name* of the Strawberry, it would at least oblige.

Sussex, Nov. 1833. A Lover of Strawberries.

What has been done with Dr. Fellowes's Bequest to the New London University, of "as much ground in the Regent's Park as the Council may deem requisite for a complete Botanic Garden?" Vide Literary Gazette, 27th January, 1827. C. C. C. C.

London, Oct. 28*th*, 1833.

Beautiful White-Flowering Schizanthus.—Mr. Myles Priest, a nurseryman of Reading, has lately raised a beautiful white-flowering Schizanthus, which has been named the Schizanthus Priestii. The drawing he has kindly sent us exhibits a plant of a graceful and delicate appearance, the corollas being wholly white, except a beautiful yellow spot at the bottom of the upper segment of each flower. And there seems little doubt, from the accounts of those who have seen the plant, but that it is an entirely new and distinct variety. It grows about two feet and a half high, from a single bottom stem, and having about twenty-four branches or side stems, each producing from twenty to thirty flowers, so that the plant, has at one time upwards of six hundred blossoms in full flower! and continues flowering for upwards of three months. It has a very beautiful appearance, and cannot fail to be much admired. We had thought to have given a figure of it in the *Register*, but as white flowers never show to advantage on paper, we fear we should not be able to do it justice. Mr. Priest proposes offering the young plants for sale.

II.—NATURALIST'S CALENDAR,

OR

OBSERVATIONS ON NATURE FOR JANUARY.

Growth of Stones.—Tourneforte, the celebrated French Naturalist, inferred that rocks grow. Linnæus also laid it down as a first principle that "stones grow;" while "vegetables grow and live; and animals grow, live and feel.' But except in the case of depositions of stony matter from an aqueous solution, such as occasion the relieving of names cut in the rock at Antiparos, and the incrustation of wigs, bird's nests, birch brooms, and other things exposed to its influence, at Matlock, in Derbyshire, stones and rocks may more correctly be affirmed to decrease than increase, subjected, as all those which are uncovered must be, to the repeated action of rains and frosts. In the beds of rivers, and the basin of the sea, the incessant motion of the water must, in the same way, produce a constant wearing down into sand of the hardest rocks and stones which are there deposited. —*Field Nat. Mag.*

Thaw.—The Honourable and Reverend W. Herbert, says that in the neighbourhood of Spofforth, when a very sudden and mild thaw takes place, with perfect calm, after a severe frost of some duration, it is always followed by a violent gale of wind, within twenty-four hours. This he supposes is occasioned by the volumes of cold air from Craven and the Moors, which rush down upon the lower regions when the temperature is suddenly released, and becomes unusually warm. —*Field Nat. Mag.*

Calcium.—One of the most useful, and generally known earths and alkalis is lime. By means of galvanism, Davy succeeded in separating from it a metal possessed of moderate lustre; but in so small a quantity, that it was not possible to make sufficient experiments of it. To this he gave the name of *Calcium*. When heated in contact with oxygen, it takes fire, and forms an oxide, which is lime. Pure lime is tasteless, and insoluble in water; it readily absorbs water poured on it, swells, heats, bursts, and is converted into hydrate of lime, commonly called slaked lime. It has now acquired a taste; it is soluble in water, and the more so if the water be cold. The solution is called lime-water; its taste is styptic, followed by sweetness. The alkaline properties of lime-water are powerful, and it renders vegetable yellows brown.—*Lardner's Cab. Cyclop.*

Tartaric Acid.—Every one knows, that when a large quantity of the juice of grapes is left to spontaneous fermentation the result is wine. When wine has been kept some time to purify in wooden vessels, it deposits on the sides of the vessels a hard crust of dark coloured matter, the taste of which is sour. This matter is impure; but, when purified by various crystallizations, it becomes perfectly white and crystalline: and then it is known by the name of *cream of tartar*. Tartaric acid may be obtained from cream of tartar by a peculiar process. It has an exceedingly acid taste; it dissolves readily in water, and is soluble in alcohol. This acid exists abundantly in other fruits, but especially in the tamarind. It exists in the grape along with citric, malic, and an acid called vinic. These four constitute the agreeable tartness of the juice of that fruit.—*Lardner's Cab. Cyclop.*

Geography of Mars.—In this planet we discern, with perfect distinctness, the outlines of what may be continents and seas. Of these, the former are distinguished by that ruddy colour, which characterizes the light of this planet, which always appears red and fiery, and indicates, no doubt, an ochery tinge in the general soil, like what the red sandstone districts on the earth may possibly offer to the inhabitants of Mars, only more decided. Contrasted with this, by a general law in optics, the seas, as we may call them, appear greenish. These spots, however, are not always to be seen equally distinct, though, when seen, they offer always the same appearance. This may arise from the planet not being entirely destitute of atmosphere and clouds; and what adds greatly to the probability of this is the appearance of brilliant white spots at its poles, which have been conjectured, with a great deal of probability, to be snow; as they disappear when they have been long exposed to the Sun, and are greatest when just emerging from the long night of their polar winter. By watching the spots, during a whole night, and on successive nights, it is found that Mars has a rotation on an axis in a period of 24th. 39m. 21s. in the same direction as the earth's, or from west to east.—*Sir. J. Herschell, on Astronomy.—Cab. Cyclopædia, p.* 279.

The Dragon Fly—The situations where these insects are most commonly found are near the water's edge, sporting among the flags; in pasture lands and in gardens. The great Dragon Fly is remarkably rapid in its career, seldom stopping to rest, and is extremely watchful. Every one, who pretends to any thing like observation, must have remarked the beautiful and perfect eye of this insect. It forms an interesting object for the microscope. Although the insect seems formidable from its size, it is quite harmless. The country folks, however, in some places, have given it the uncourteous name of horse-stinger. It has no sting, nor does it infest horses.—*Field Nat. Mag.*

Chrysalis of the Death's Head Hawk Moth.—Those who endeavour to rear these moths often fail, after the insect has passed into the chrysalis state. A good method is to moisten the chrysalis every morning with warm water, and to place it in the breeding cage near the pie, by which means the fluids of the body are preserved, and the case is not too strong for the perfect insect to penetrate. If placed in a bark stove with plants, and covered with the earth, they will not perish, as is the case with those generally exposed to the temperature of our climate. —*Field Nat. Mag.*

The Lilac Moth.—(Gracillaria anastomosis) is double brooded, the first appearing in May, from the Caterpillars of the preceding autumn, the second in July. The eggs are laid in rows, consisting of from three to a dozen, and are placed along the nervures on the underside of the privet. In five or six days, the eggs are hatched, and the larvæ eat into the leaf, mining to the upper surface, where they eat the parenchyma, leaving the epidermis untouched. In about a fortnight afterwards, they leave their mines, and commence rolling the leaves: the roll is fastened on the outside with a few threads, and the ends are drawn close. Here they remain until full grown, eating only half the substance of the leaf, when they drop from the leaves and retire underground, where they spin a strong case, and in a few days change into the pupæ. It is principally on trees in shaded situations, and on the ground-shoots, and under-branches of others, that the mother-moth lays her eggs.—*Brit. Ent.*

TRUFFLES.—An immense stock of very small Truffles was discovered some years ago, under a young cedar tree, upon the lawn, near the House at Highclere. Mr. Gowen successfully tried the experiment of transplanting several of these, and setting them under beech trees, marking the spots where they were planted. They increased in size, and became much finer than those which were left.—*Field Nat. Mag.*

HATCHING EGGS BY STEAM.—As the hatching of Eggs by Steam seems to be a favourite mode amongst a peculiar class of Society connected with the fowl trade, the following table taken from different authors, by Count Morozzo, and given in a letter from him to Lacepede, may be interesting.

Names of Birds.	Periods of their Incubation.	Duration of Life.
Swan	42 Days	About 200 Years.
Parrot	46 do.	100
Goose	30 do.	80
Eagle	30 do.	Period Unknown.
Bustard	30 do.	
Duck	30 do.	
Turkey	30 do.	
Peacock	26 to 27	About 25 to 28
Pheasant	20 to 25	18 to 20
Crow	20 do.	103 or more.
Nightingale	19 to 20	17 to 18
Hen	18 to 19	16 to 18
Pigeon	17 to 18	16 to 17

The Crane, and Heron, as well as the Ostrich, hatch their Eggs chiefly by the heat of the Sun.

WINDOW SWALLOW.—Two fine examples of immense masses of basalt are afforded on the hills of Penmaen Bach, and Penmaen Mawr. The cap or summit of the latter, in appearance much resembles a volcanic crater. It is curious to observe, that the north-west front of this last hill is the favorite resort of multitudes of the common house swallow, whose clayey nests cover the rock in many places.—*Field Nat. Mag.*

III.--SOCIETIES.

CONNECTED WITH HORTICULTURE AND NATURAL HISTORY.

LONDON HORTICULTURAL SOCIETY.

THE Meetings during the winter being confined to one in each month, that for November took place on the 5th. The only novelties observed were seedling Pine Apples, seedling Chrysanthemums, and flowers of Mimulus Smithii, the new variety raised by Mr. Geo. Smith, of Islington. It is a powerful rival in beauty to the favourite M. rivularis and was much admired, as were also certain of the twelve sorts of Chrysanthemum exhibited by M. Wheeler, of Oxford, which will no doubt be regarded as agreeable changes from the Chinese sorts that have now been so long established in the estimation of the public. Mr. W.'s success has been considerable, and his exertions were last season rewarded by a medal from the Society. The

Dahlias from Mr. Chandler's Nursery were extremely good, and it was the only collection of those flowers that appeared; those in the Society's Garden have been long since destroyed by frost. Among the remaining articles were remarked very fine selections of Chrysanthemums, Apples, and Pears from the Society's Garden. Many of the latter were found ripe much earlier than usual, owing to the dryness of the season, especially the Passe Colmar, Beure Diel, and those excellent varieties, the Forelle nelis d' Hiver, &c.

GENEVA MEETING.

At the Horticultural Society Meeting, held at Geneva, New York, America, Sept. 30th, 1833, there was a large collection of Fruits, Vegetables, Plants and Flowers exhibited, and the attendance of visitors was large. The officers for the ensuing year were elected, and afterwards the Society sat down to a good dinner.

THE NORTH DEVON HORTICULTURAL SOCIETY.

A Quarterly Meeting of the North Devon Horticultural Society was held on Friday, Nov. 15th, in the Rooms in this town, and as it was accompanied with an exhibition of plants and fruits; it attracted the attention of a good many of the amateurs and other genteel inhabitants of the neighbourhood. The exhibition, as might be expected at this late season of the year, was comparatively small, but on the tables in the centre of the room were some choice and very fine plants, chiefly, as we understood, from the garden or greenhouse of R. W. Grace, Esq. particularly a fuschia macrophila, seven feet high; a cactus truncatus, five feet high; a strelitzia regina, dichorisandia thyrsifolia, corrioca speciosa, &c. &c. There were also some splendid specimens of dahlias, German asters, and other flowers, and a good display of very choice fruits.

The following experiments on the culture of the potatoe, made by J. B. Turner, Esq. of Ilfracombe, were submitted to the meeting by R. W. Dickenson, Esq.:—

Different sorts of sets planted 17th May, 1833.	Number planted.	Number that grew.	Appearance of Top.	Number fit for Table.	No. of small.	Total number.	Gross weight
Large whole potatoes,...........	8	all	very fine.	56	35	91	18lb
Large whole ditto, blooded, by scooping a piece out an inch in depth and diameter.......	8	all	very fine.	55	32	87	16
Small whole potatoes............	8	all	small spiral.	18	21	39	1
Sets with a single eye cut in the usual way.................	8	all	ditto.	22	5	27	4¼
A crown eye cut circular and conical, ¾ inch diameter at the base or eye............	8	all	fair size.	37	10	37	5½
A side eye, cut as last...........	8	7	ditto.	18	8	26	3¾
Rind with two eyes, ¼ inch thick.	8	7	small.	12	10	22	2¾
Sets with the eye cut in half.....	8	all	ditto.	20	6	26	2½
Large potatoes, with the rind not peeled off, but all the eyes scooped out about half an inch deep...............	8	4	fair size.	19	24	43	4
Large potatoes peeled ¼ of an inch thick all over.........	8	4	small.	9	11	20	9
Budded potatoes.............	6	all	ditto.	*			

* None fit for table, and the produce was very small, and a mixture of white and red, according as the bud or stock grew: so that it would appear, no variety can be obtained from budding. The seed is the only source from whence varieties can be obtained.

General Observations.—The sort on which the experiment was made, was the Devonshire red rough; the sets, &c. were planted on the 17th of May, 1833, in rows 20 inches asunder, and 10 inches distance, dressed with white rotten dung, and earthed up twice; the crop was dug on the 12th of November following, and the best looking samples were No. 2 and 5.

From the foregoing results it may be concluded, that it is next to an impossibility to destroy with the knife the germ of the potatoe; almost any part of it will produce, and if the set has but one eye, and especially the crown eye, it is immaterial how small that eye is cut. That large whole potatoes produce the greatest return; the crown eyes next, in fact, in some places where potatoes are scarce, the crown eyes have been cut for setting, and the other part of the potatoe used.

IV.—MONTHLY HORTICULTURAL CALENDAR,

FOR JANUARY.

VEGETABLE DEPARTMENT.

Cauliflower Plants in frames must have plenty of air, and be protected from frost. If any symptoms of slugs appear amongst them, scatter a little quick-lime over the whole bed on a mild night after it is dark.

Asparagus should continue to be planted in hotbeds.

Radishes sown on a hotbed, in the beginning of the month, will be ready to draw at the end of February. If sown at the middle or end, they will be ready early in March; if the weather be favourable.

Potatoes planted in light sandy soil, on a slight hotbed, in the beginning of the month, will be ready for use by the beginning or middle of May.

Rhubarb Roots taken up and planted in a little heat will produce stalks fit for use in a fortnight. Renew them as often as is necessary.

Sea-Cale covered with pots and dung in the beginning of the month, will be ready for use by the middle of February; and if a certain quantity of roots be covered every fortnight, the produce will continue until Asparagus is ready in the open ground.

Herbs in Pots, introduced in heat, will produce sprigs for use in a fortnight.

Peas and Beans now sown in light soil, on a warm border, will be more favourably circumstanced for the first crop than those sown last month; but, in all cold situations, the best method is to sow in pans or boxes in February, and transplant as soon as the weather permits.

FRUIT DEPARTMENT.

Apple Trees newly planted, must have some half-rotted dung laid about their roots, if this was not done last month.

Cherry Trees in Tubs, now brought into the forcing-house, will produce fruit in the beginning of May. Cherry Houses now started will produce about the middle of May, the difference of ripening arising from the fact that the trees in the latter, which produce the general forced crop, are planted in the border. Finish pruning those on the open walls, except the Morella.

Fig-Trees planted in forcing-houses now started will ripen their fruit about the middle of May. *Fig-Trees* planted in tubs or pots now introduced will ripen fruit in April.

Gooseberry and Currant Trees finish pruning as soon as convenient.

Grapes.—Those vines on the rafters now started will ripen their fruit in June or July.—Vines in pots, now introduced into a forcing-house, will produce in May and June.

Peach and Nectarine Trees in forcing-houses, now started, will ripen their fruit in June and July. Those in pots or tubs, if placed along the flues, will produce a fortnight or three weeks earlier.

Raspberries in Pots, introduced into the forcing-house early in the month, will ripen their fruit in April.

Strawberries in Pots, introduced into the forcing-house in the beginning of the month, will ripen their fruit from the end of March to the end of April, according to the sorts.

FLOWER DEPARTMENT.

Roses in Pots, placed in the forcing-house in the beginning of the month, will produce flowers by the middle of March; if placed in at the end of the month, by the end of March or beginning of April, if the weather be favourable.

Ranunculuses planted in the beginning of the month in frames, will come into flower about the beginning of April, if the weather be fine.

Mignonette and Ten Weeks Stocks sown in pots about the end of the month, and placed on a slight hotbed, will come into flower in May immediately succeeding those sown in the autumn.

Auriculas will be much improved in flowering, if they be top-dressed about the end of this month or beginning of February; be careful during this month not to over-water them, they thrive best if kept somewhat dry during winter.

Camellias in frames being introduced into a little heat either in the window of a warm room, where they will be exposed to the sun, or any other convenient situation, will soon come into flower.

Calceolarias in the greenhouse should be repotted, if they require it.

Greenhouse Plants should be kept rather dry during this month, also be careful to keep them clear from all dead leaves.

THOMAS HARDCASTLE, PRINTER, CHURCH-STREET, SHEFFIELD.

THE

HORTICULTURAL REGISTER,

FEBRUARY 1ST, 1834.

PART I.

ORIGINAL COMMUNICATIONS.

HORTICULTURE.

ARTICLE I.—LORD BACON, ON GARDENS.

BY VIOLA.

"EACH flower of slender stalk, whose head though gay
"Carnation, purple, azure, or speckl'd with gold,
"——————and many a walk travers'd
"Of stateliest covert, cedar, pine, or palm." MILTON.

THE labours of your second Volume have drawn to a close; and I sincerely congratulate you on the high stand which your admirable work has taken among the useful and scientific periodicals of the day. It possesses several distinctive qualities, among them may be remarked that gentlemanlike tone of writing, and proper spirit, in which are carried on the discussions necessarily arising among men of scientific research, possessing different views, and different caliber of intellect.

Of all occupations, that of gardening seems, from its sweet and primitive simplicity, best calculated to soften the acerbity of human nature, and allay "the fever and the fret," of this "working day" world.

Although I am an enthusiastic lover of trees, shrubs, and flowers, I can only wonder and admire; I can neither cultivate new kinds,

nor send you communications of value; but I can unite my very humble endeavours with those of greater weight and power, to render the pages of the *Register* generally interesting.

Readers are become so numerous, and the study of horticulture so fashionable, that I venture to suppose mere details of culture may be enlivened by matter, which, although bearing on the subject of gardening, may yet communicate neither new methods of propagating plants, nor matter of scientific research.

Some of your younger readers may be unacquainted with Lord Bacon's Essays: that on gardens is so very beautiful, and the subject so interesting, that I venture to hope a few extracts from it may please those to whom it is new. To such I need not apologize; and your elder readers, who are familiar with the writings of that "wisest brightest, meanest of mankind," will, I hope, pardon me in consideration of those who have been less fortunate.

Thus Lord Bacon begins his Essay:—"God Almighty first planted a garden; and indeed it is the greatest refreshment to the spirits of man; without which, buildings and palaces are but gross handy works: and a man shall ever see, that when ages grow to civility and elegancy, men come to build stately, sooner than to garden finely, as if gardening were the greater perfection.

I do hold it, in the royal ordering of gardens, there ought to be gardens for all the months in the year, in which, severally, things of beauty may be then in season. For December, January, and the latter part of November, you must take such things as are green all winter; holly, ivy, bays, juniper, cypress trees, yew, pines, fir trees, rosemary, lavender; periwinkle, the white, the purple, and the blue; germander, flag, orange trees, lemon trees, and myrtles, if they be stoved; and sweet marjoram, if warm set.

There followeth for the latter part of January, and February, the nuzerou tree, which then blossoms; crocus vernus, both the yellow and the gray; primroses, anemones, the early tulip, the hyacinthus, orientalis, chaniairis fritellaria. For March, there come violets, especially the single blue, which are the earliest; the early daffodil,* the daisy, the almond tree in blossom, sweetbriar.

In April, follow the double white violet, the wall-flower, the stock-gilliflower, the cowslip, flower-de-luces, and lilies of all natures; rosemary flowers, the tulip, the double pœony, the pale daffodil, the French honeysuckle, the cherry-tree in blossom, the damascene and plum-trees in blossom, the white-thorn in leaf, the lilac-tree.

* "That comes before the swallow dares,
"And takes the winds of March with beauty."—SHAKESPEARE.

In May and June come pinks of all sorts, especially the blush pink; roses of all kinds, except the musk, which comes later; honeysuckles, strawberries, bugloss, columbine, the French marigold, flos Africanus, cherry-tree in fruit, ribes, figs in fruit, rasps, vine-flowers, lavender in flowers, the sweet satyrian, with the white flower; herba muscaria, lilium convallium, the apple-tree in blossom. In July come gilliflowers of all varieties, musk-roses, the lime-tree in blossom, early pears, and plums in fruit, gennitings, cadlins. In August come plums of all sorts in fruit, pears, apricots, berberries, filberts, musk melons, monks hoods of all colours. In September come grapes, apples, poppies of all colours, peaches, nectarines, cornelians, quinces, melocotones,* wardens. In October, and the beginning of November, come services, medlars, bullaces, roses cut, or removed to come late, hollyhocks, and such like. These particulars are for the climate of London; but my meaning is perceived, that you may have "ver perpetuum," as the place affords.

And because the breath of flowers is far sweeter in the open air, (where it comes and goes, like the warbling of music;) than in the hand, therefore, nothing more fit for that delight, than to know what be the flowers and plants that do best perfume the air. Roses, damask and red, are fast flowers of their smells; so that you may walk by a whole row of them; and find nothing of their sweetness; yea, though it be in a morning's dew. Bays, likewise, yield no smell, as they grow, rosemary little, nor sweet-marjoram; that which above all others yields the sweetest smell in the air, is the violet, especially the white double violet, which comes twice a year, about the middle of April, and about Bartholomew tide. Next to that, is the musk-rose; then the strawberry leaves, dying with a most excellent cordial smell; then the flower of the vines, it is a little dust, like the dust of a beut, which grows upon the cluster, on the first coming forth; then sweet-briars, then wall-flowers, which are very delightful to be set under a parlour or lower chamber window; then pinks and gilliflowers, especially the matted pink, and clove-gilliflower; then the flowers of the lime-tree; then the honeysuckles, so they be somewhat afar off. Of bean-flowers, I speak not, because they are field-flowers; but those which perfume the air most delightfully, not passed by, as the rest, but being trodden upon and crushed, are three, that is, burnet, wild thyme, and watermints; therefore you are to set whole alleys of them, to have the pleasure, where you walk or tread."

Then follows a plan for a "prince-like garden," which would, however, be misplaced in this paper.

* Will you be kind enough to inform me, what kind of fruits these two are?

It is pleasant thus to be enabled to compare the simplicity of gardening in the reign of our "Great Elizabeth," with the present "high and palmy state" of horticulture. The above description too, well corroborates that admirable remark with which the essay commences;—"When ages grow to civility and elegancy, men come to build stately sooner than to garden finely, as if gardening were the greater perfection." Our palaces and cathedrals are extant proofs of the admirable state of architecture, at the time that our earliest works on gardening show the poverty and scantiness of contemporary horticulture.

The glorious writer of the above has likewise proved, that his ideas on gardening—as on every other subject—were high above, and far beyond, the times in which he lived: for why should he write a dissertation and form plans, unless the taste and practise in gardening were in a state to require his assistance?

December 15th, 1833.

ARTICLE II.—A PRACTICAL ILLUSTRATION,

OF THE POSSIBILITY OF RENDERING A QUARTER OF AN ACRE OF LAND VERY PLEASURABLE AND EXCEEDINGLY PROFITABLE;

And of converting an intolerable Nuisance into a means of promoting both, at a small Expense.

BY J. D.

WITHIN an oblong piece of ground, fifty-two yards long, by twenty-three yards wide, (about a quarter of an acre,) situated in a village five miles from London, is my dwelling-place, to which a small stable is attached. The house stands at the north-east, and the stable at the south-east angles of the ground, the longitudinal direction of the whole being due north and south, the house fronting north, and only a few yards from a public road. Other part of the ground, at the back of the house, is occupied by a court yard, and a yard is attached to the stable, which is also the drying ground for linen, the former separated from the gardens by a trellis fence, and the latter by a clipt hornbeam hedge, used for the drying of clothes. The remainder of the ground is divided into three portions of gardens for pleasure, for fruit, and for vegetables, and yet, though perfectly distinct, the three group only as one. The whole plot is bounded by brick walls, averaging about two yards and a half in height, except in front of the house, which is a palisade fence, and except also a piece of wall about twelve yards in length, which is six yards high.

These walls are covered with apricot, peach, nectarine, plum, pear, cherry and fig-trees, and at intervals a few raspberry and currant bushes intermingle, with various flowering shrubs of Pyrus japonica, Coculus indicus, Bignomia Myrtle, Rose Honeysuckle and Passion flower. The pleasure garden, which is on the west side of the house, is grass bordered next to the walls, with a variety of dwarf shrubs chiefly Kalmia, Azaleas, Rhododendrons, Andromedas, Hydrangeas and Roses. The grass plot, on three sides, has a margin of shrubs and flowers in parterres of various forms, on the other side are standard trees of Sycamore, Siberian Crab, Kentish Cherry and Quince, placed so as to afford shelter and shade to the house. The space allotted to the growth of fruits has, within it, standard apple, pear, plum, cherry, damson, and medlar trees, with gooseberry, currant, and raspberry bushes and strawberries underneath. The vegetable portion consists of sixteen beds, each seven yards long and four feet wide, one bed giant rhubarb, another sea-kale, four asparagus, and the remainder is used for the growing of the ordinary culinary vegetables. A border exclusively for pot, medicinal, and other herbs extends from the kitchen door on two sides of the offices. Gravel walks of a yard and a half wide connect the several portions of garden with the house and offices. In the fruit garden is one two-light frame, and in the vegetable garden a three-light frame, used to preserve half hardy plants, and to produce early vegetables.

We entered upon these premises just three years since; the only trees then upon it were one plum, one apple, and two cherry trees, the land was partly garden and partly field, much exhausted by excessive cropping. The surface a shallow coat of vegetable mould, upon a deep subsoil of yellow loam, with a sileceous base, water standing generally at two yards beneath the surface, at fifteen yards from the house, a cess-pit, six yards deep, receives by means of a drain, the foul water of the back kitchen (there being no sewer near the cess-pit) and which had become an intolerable nuisance from the sides being saturated with soluble matter, the overflow of which ponded back upon the house. Every part of the garden is now in high condition, the wall and standard fruit-trees are of the best sorts, and in the most thriving state, and altogether a very productive piece of ground. Some of the practices which have been adopted towards producing so successful a result, aided by the very judicious management of my better half, who is a most enthusiastic gardener, and who follows up with zeal whatever improvements are suggested, I will detail. In the winter after my entry, the whole of the ground, except the part designed to be grass, was trenched four spits, or two

feet and a half deep, the top spit was cast into the bottom, the bottom spit upon that, and the two middle spits upon the top, dung being placed between the two top spits. The tap roots, and all descending roots were cut from the trees before planting, and care was taken that no portion of the dung should come in contact with the bark of the trees. The trees were planted shallow, and the surface around them being intended to be planted with strawberries, would require only to be forked occasionally, and the annual dressing of the strawberry plants would also be beneficial to the roots of the trees. The wall-trees were nailed in the fan form, in order to promote their growth, and to insure a due proportion of good bearing wood, which has been attained. In January next, or as soon as the weather permits after Christmas, they will be fully pruned and nailed, rather in a different form to any of the various methods so zealously insisted upon by several writers in your most useful *Register*. My method will be by "line and rule." Thus in the centre of the space between two trees, the iron pin of the garden line will be thrust into the ground; a few yards of the line will be run off the reel, the lines from the pin will be stretched to the centre shoots of the two trees next to it, where a loop knot will be tied on the line, and from them other loop knots at six inches apart, so as to embrace all the main branches of those sides. These branches will then be nailed to the sweep of the arch, and as near as may be one foot apart, and so that each leader may run between the leaders of its neighbour, as nearly six inches from each other as circumstances will admit, thus:

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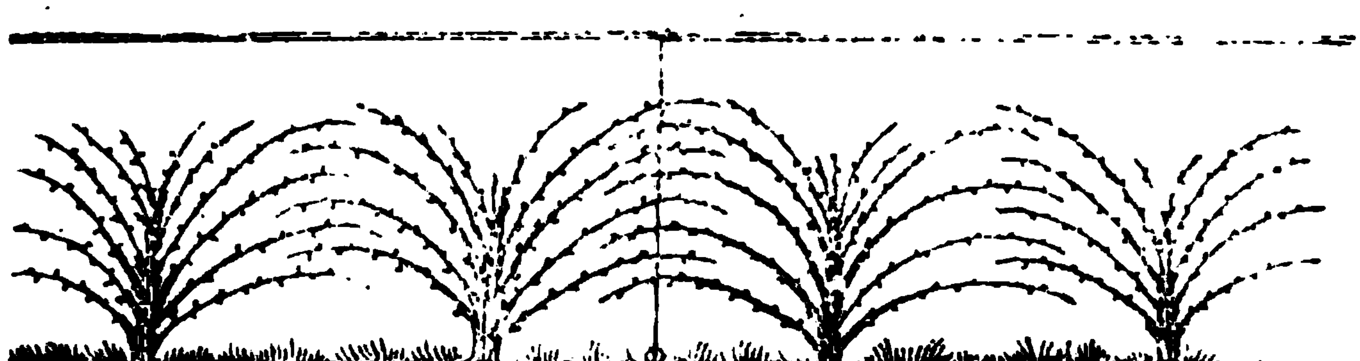

Experience has shown that by carrying the points of the leaders downwards, fruit is induced, because the sap juices are checked in their circulation by the recumbent form of the branches, and it is clear that vacancies in either tree may be supplied by the surplus wood of the other so as to keep the wall fully clothed. In any extensive pruning of trees, whether against walls or standards, as much depends upon the due pruning of the roots as of the branches, only taking care not to prune the roots in the same year that the branches are pruned. The pruning of the branches in all cases should precede

the pruning of the roots, but this of course refers only to trees that produce wood in excess, and which, the too free application of the knife but too often promotes; to retard that growth, recourse should be had to root pruning, which I thus apply. A bar of iron five feet long, one inch and a half wide by one inch thick is thus formed, (Fig. 5, *a*) nine inches wide at the bottom, steeled and hardened to

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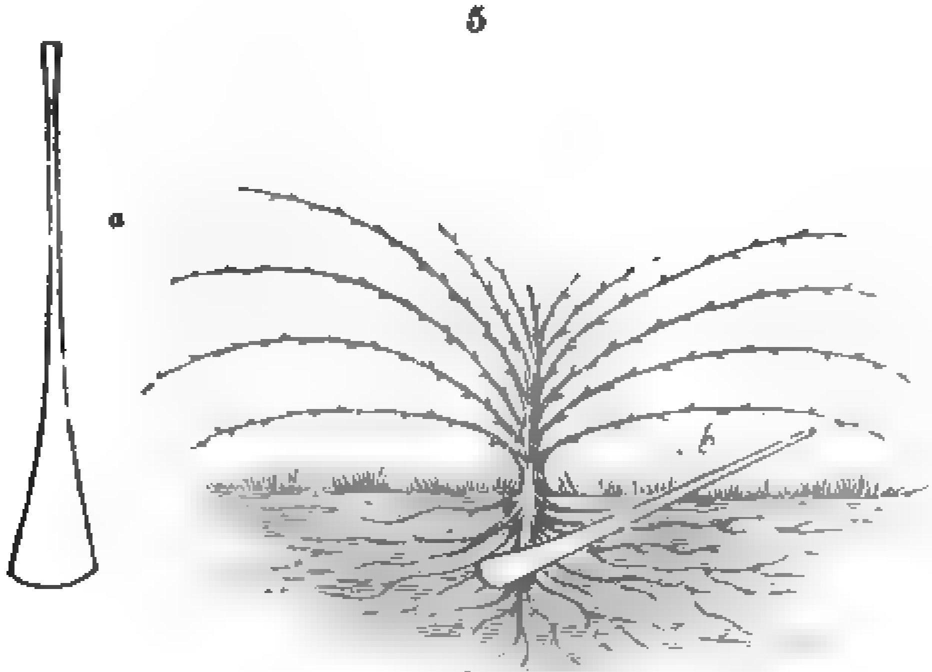

a chisel edge; with a common woodman's beetle this is driven through the roots at from two to three feet from the stem of the tree, and at an angle of about forty-five degrees, (*b*) each insertion of the pruner following closely the last insertion until the circle, if a standard, or the semi-circle of a wall-tree be completed, the roots thus severed will produce radicals in abundance, and fruit-bearing wood will be induced in the room of barren and unproductive leaders. The strawberry plants, which are for the most part Wilmots, Keams, and the Downton sorts, were, in 1831, planted at half a yard apart; from these the runners of this year (not severed) were placed in the intermediate spaces, and the old roots dug up, whose places will be supplied by the runners of the next year, and thus as it were almost imperceptibly the renewal of the plants will be going on continually on the same site. But these are points of minor consideration, when compared with that of converting an intolerable nuisance into a source of profit, a nuisance so general as to pervade almost every man's dwelling place, particularly in the country town. The abominable stench arising from the filth and foul water of the wash-house, the scullery, and the privy, when in a state of stagnation; these, as I have before stated, in our case, originally flowed into a cess-pit in

the garden, and thence for a time soaked away through the surrounding soil, until that becoming saturated with the vegetable and animal matter contained in the water in a state of decomposition, the whole mass became putrid, and the surrounding atmosphere contaminated and unwholsome.

An opening was made into the centre of the brick cover of the Cess-pit, and a neighbouring copper-smith, for £2. supplied a pump, six yards long, and attached to it a series of tin pipes, in six feet lengths, one and a half in diameter, with a due proportion of knee-pieces, sufficient to command every bed, border and parterre in the garden By these means, liquid manure was conveyed to the root of every tree and plant in the garden, and by filling the trenches round the asparagus, sea-kale and rhubarb beds, when the plants were about to vegetate in the spring, the produce exceeded the most sanguine expectations, and the process being repeated three or four times in the season, the result of each application was equally satisfactory, any failure in the quantity of liquid manure in the cess-pit was supplied by the spring water pump, which at the same time cleared the drains, and made the whole place wholesome and sweet. In emptying the cess-pit of night soil, one of the beds set apart for vegetables was excavated to the depth of two and a half feet, and the night soil put into it, and covered with stable litter, the earth by degrees being cast upon it. In the spring, the bed was sown with onions, of which there was an excellent crop; this year there has been a crop of French beans upon the same bed, the produce of which was extraordinarily great, and at this time there is a crop of broccoli growing. In the spring, the bottom soil will be taken out, and used to dress the parterres and flower borders, which will, from the known chemical properties of the soil, no doubt, much increase the size and brilliancy of the flowers. I have stated this matter more in detail than many persons may think necessary, but I have done so, because I am satisfied that numberless housekeepers in the vicinity of large towns are not aware of the advantages that may result from the proper application of the stagnant putrid water and night soil, which necessarily accumulates near every dwelling. I will just add, that at this season of the year, my partner collects the roots of the scarlet runners, Dahlias, Marvel of Peru, and of the border Geranium: and when free from external moisture, places them in layers, in a box, with a small quantity of straw between the layers—finally covering the whole with straw or saw-dust. The box is then placed in a closet under the stairs or celler, and at the usual time in the spring, the roots are taken out and planted, and generally with success.

ARTICLE III.—ON THE CULTURE OF VINES.

BY MR. WM. GREY,

SHOTLEY-GROVE, NEAR DURHAM.

In reply to Mr. Chanter, concerning Mr. Witty's Gas Furnace, the figure 54 at page 447 is of a different construction from those at Sandyford Lodge. Mr. Witty must have altered his plan in the furnaces for consuming smoke; a friend of mine in Surry, informs me he has two furnaces the same as Mr. Chanter describes; he says that when the coal is coked to a solid body, it will not slide down the plane in the easy manner by the screw, as Mr. Chanter describes, but he is obliged to use the poker with great force, to break the coked coal down on the fire; and when the fire is low, it will not kindle readily, so that he has often to seek fire from other furnaces to re-kindle it, therefore there can be no saving of time in that part. My friend also disputes the statement that the smoke is consumed. Mr. Wilmot says he commenced forcing two vineries at one time, and that the one with the gas furnace was a month earlier than the other. This may be accounted for without any virtue in the gas furnace, because if Mr. Wilmot had been in the habit of forcing one of these vineries a month or six weeks before the other, for three or four seasons previously, and when both commenced together, the vines that had been before six weeks earlier forced had been longer at rest then the other house, would break their eyes more freely and sooner then the other, and of course ripen the fruit sooner. I have had an instance of the same nature from one of my houses having been forced earlier without any gas furnace.

Mr. Chanter says I labour under an error, and quite mistake the subject. I beg to thank Mr. Brown, jun. for the voluntary information he gives me on the cultivation of vines in pots, Vol. 2, p. 497, I hope it was generally understood, in my report to the *Register*, on the culture of vines in pots, that I do not think it impossible to have grapes that way; my argument is, they cannot be obtained in quantity and quality equal to those planted out in the vinery, which opinion I feel disposed to maintain. I cannot imagine what objection Mr. Brown has to light free and rich maiden mould for potting vines, and as I found the tubs matted and full of roots in May, I think if a plant will receive any benefit from liquid manure it must be then; if fruit trees and vegetables require no other nutriment than soil and pure water, I ask for what purpose manures are applied? Mr. Brown says he never had occasion to water twice a day, as he places a feeder under the pot. Now, the feeder of water, being constantly under

the pot, will keep the soil in a wet stagnant state, and it is well known that retentive soils are the very worst for vines. I admit that some hardy sorts will succeed better in pots, such as Mr. Mearns mentions: Miller's Burgundy, and Muscadines, but they are very inferior to the white Muscat of Alexandria, Frontignacs, &c. which were the sorts I have in pots and tubs. By putting them into the greenhouse till the eyes were swelled ready to push into leaf, I was giving them spring as it were, and, by taking them from the greenhouse to the vinery, I was giving them summer. They were kept as near the glass and light as Mr. Brown could wish, but the idea of having grapes all the season round with success, I must say, quite baffles me. Vines that were taken in the end of last month will be coming in bloom in December, when the nights are long, and the days short and cloudy. If the vines be ever so near the glass, and heat be at command, the hazard is very great, if there be not two or three days bright sun shine, for the time of flowering and setting. I have frequently found the shows to curl up to the glass at that period, and wire off for want of sun; and the want of sun-shine at the time of flowering is the greatest difficulty I meet with in early forcing of vines. I think a gardener that can supply his master's table with grapes nine months out of twelve ought not to be complained of.

I called on Mr. Dewar, gardener at Redburgh, near Newcastle on Tyne, a few days ago; he is an extensive pine and vine grower, and on going through the houses with him, he took me into a vinery where a quantity of fine grapes were hanging in great perfection. White Muscates, Frontignacs, Hamburgh, and several of the bunches appeared to be two and three pounds weight, from which house he will be able to send a dish to his master's table every day till the new year. Had Mr. Brown been with me, he would have joined and said, farewell to grapes from vines in pots. A correspondent of mine saw Mr. Stafford's vines in pots in a small stove, in March 1832; he speaks very highly about the old gentleman's. My friend says, the vines were in great health, but the bunches small, Mr. Stafford told him they would increase in size wonderfully as the days lengthened. I should like to know the average weight of bunches on a vine in a pot, that has fourteen on it; my intention is to commence forcing a vincry in January, which will be ripe in June, and I would venture to say, that any one vine in the house will have more weight of fruit than any four vines in pots in Derbyshire, or Nottinghamshire. I thank Mr. Smith for his kind invitation; should I ever be in Nottinghamshire again, I will give him a call.

ARTICLE IV.

ON THE CULTURE OF GOOSEBERRIES,

BY MR. MOSES BRISTOW,

Gardener to —— Munday, Esq. Burton-on-the-Woulds, Leicestershire.

Perhaps no fruit has improved more by cultivation than the gooseberry. There is scarcely a good garden without a selection of both the small and large sorts. Some of the small fruited varieties are superior in flavour to the large ones, but this is far from being general, for, with a few exceptions, the large sorts are preferable, being, in many cases, of superior flavour, and they are ready for tarts much earlier than the small ones. Probably some of the small ones are better in cold and wet situations or seasons.

There is a considerable difference in the properties of the different sorts. Some are remarkable for size, as the Eagle, Roaring Lion, &c.; others for beauty, as the Top-Sawyer, Bonny-Lass, &c. and some for the superiority of their flavour, as Champagne, Woodward's Whitesmith, &c. There are some which ripen their fruit very early, as the Huntsman, Top-Sawyer, &c. others are ripe very late, as Warrington, Duckwing, &c. some produce amazing large crops, whilst others produce comparatively few, but of a very large size. In making a selection, for either a large or small garden, I would chuse some for their flavour, and others for their size, others for earliness, and some for their lateness, so that a succession of fruit might be obtained from an early to a very late period.

Very much depends on the situations, seasons, soils, pruning and training, and last, and probably the most, on kinds.

Gooseberry trees are sometimes trained to a sort of trellis made with stakes, stuck in the ground, about six inches apart. In this case the trees are planted about four feet distant from each other, on the border. An horizontal branch is trained within three or four inches from the ground, from each side of the main stem, and from these horizontal ones, a perpendicular branch is conducted up each stake. This mode evidently saves room, and as in some cases, where the stakes are iron, and consequently thin and small, the trees look very neat.

In suitable situations, with care, gooseberries will continue to bear abundant crops for many years.

The mode of training practised amongst amateurs, to produce large fruit for show, is, I believe, as follows:—It is well known, that

all the fruit hangs on the underside of the branches, and therefore they get a quantity of forked and hooked pegs, Fig. 6, *a*, *b*, the former to support the branches, which are inclined to trail on the ground, and the latter to hold down those which are too much inclined to grow upwards, *c*. The young trees are trained to about three, or not more than four shoots, which by means of the pegs, are regularly spread out horizontally. During the summer's growth, the three shoots will produce a quantity of young shoots, and most of these, in the autumn pruning, are shortened to one eye, while the others are pruned to half their length. No shoots are left either at the extremity or the origin of the main branches, but only at the sides; the number of shoots left should not exceed two or three on each main branch. If the tree be strong, and but few branches are left, the size of the fruit may be expected to be proportionally large.

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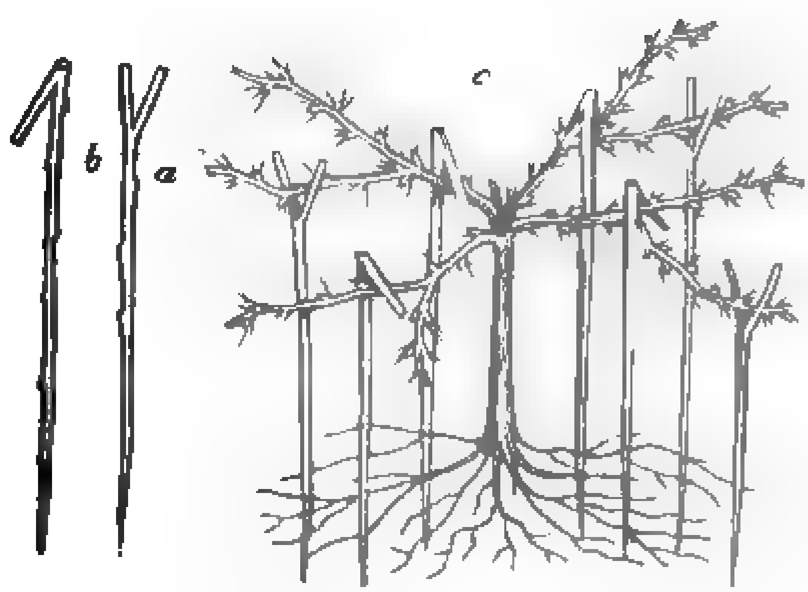

In after years, when the main branches grow beyond the proper bounds, they are cut sufficiently back to keep them in due form, and also to keep a proper supply of good wood.

The roots also are occasionally pruned. When they have extended too far from the stem, the soil is dug away, and the longest roots are shortened back to pretty near half their length, the roots being then covered in with fresh rich loam.

The soil found best for gooseberries of this kind in particular, is of a rich, deep, and moderately moist nature. The situation should be somewhat sheltered. In planting the trees, fill the trenches with manure around the plant, into which the roots will strike, and if a shallow bason be left round the stem, for holding the water, soap suds, or liquid manure, which is given in dry weather to induce the fruit to swell up.

In planting cuttings of these choice sorts, the usual system is to tie a little moss round the bottom of the cutting, which is found greatly to assist in the formation of strong roots.

Insects infesting Gooseberries.—The most prevailing depredators are the caterpillars of the Fly, given in Fig. 7.* There are four or five distinct generations of the insects. One pair of the flies existing in spring, are supposed to be able to produce during their short lives no less than sixty millions of caterpillars. The perfect flies live but about nine or ten days, and usually lay their eggs about the third or fourth days, after having arrived at the winged state; these eggs are hatched in about a week, the caterpillars, when first hatched, being very small, eat very little, but after a few days, they begin to eat voraciously; and when about ten days old, they make most dreadful devastation. They continue to feed about a fortnight, and then descend into the soil, entering into the pupæ state, in which they continue eighteen days, after which they emerge as perfect flies. They may be destroyed while in the caterpillar state, with lime-water and other materials.

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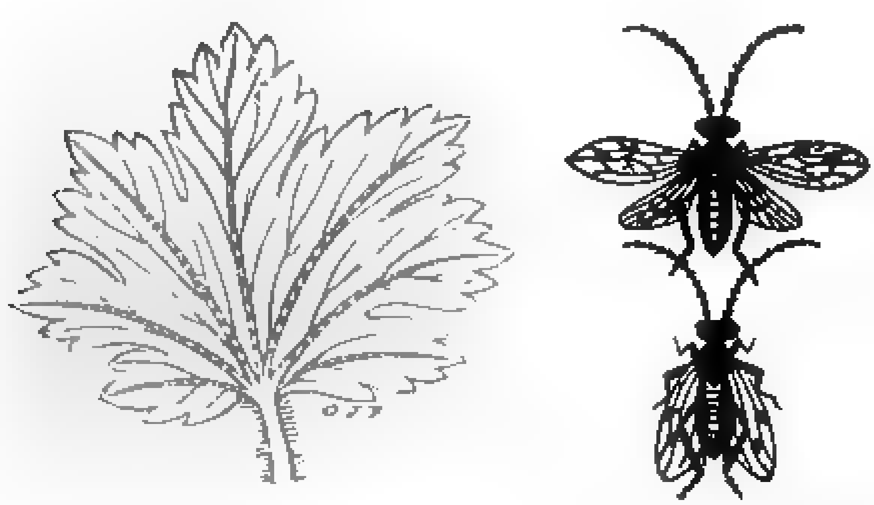


Having stated thus far, I beg to say a few words on a peculiar mode of treatment which I have practised with the greatest success. The usual time of pruning is well known to be winter; this practice I never follow, but cut my gooseberry trees about the end of May, or beginning of June. They may be cut with equal facility then as at any other time, and with far greater advantages. From this summer pruning, I am able to collect a great quantity of young fruit, both for bottling and market. In the summer of 1832, I collected, from the branches which were cut off, as many as ninety pecks of berries, eighty of which I sent to Nottingham market, where they sold for one shilling per peck. The other ten pecks were used by our family for bottling.

* The name of the Fly which is here omitted, will be found amongst the Queries.

After pruning, go over the trees, and thin out all the small berries for tarts and other purposes, leaving the finest for table use.

Propagation.---Most people are aware that they strike readily from cuttings. The best time for planting these is September. Trim off with the knife all the buds upon that part of the cutting which goes into the ground, leaving only four buds at the upper part of each, to form the tree. When these cuttings have grown one season, take them all up, and cut off all the roots about half way down that part of the cutting which was in the ground; the part thus cleared of roots will form a lengthy stem to the tree, but take care to leave sufficient roots for the growth of the plant, and plant it again very shallow. Head each cutting in at a bud that will lead the plants erect. The four buds at the top will form a pretty head.

I think it indispensable that the cuttings should be taken up at the end of the first year, or that part of each which is beneath the soil will not swell, but will remain for many years the same thickness as when planted. Is this for want of light and air ?

The advantages derived from the forementioned method of treating gooseberry trees are,

1st. A better choice of the wood which ought to be cut away because it is then in full bearing.

2nd. A great quantity of fruit is obtained for use without any disadvantage to the trees.

3rd. The branches being thick set and close are a shelter from the injurious effects of late spring frosts, which often, in one night, destroy most or all the hopes of the cultivator.

ARTICLE V.—CULTURE OF THE POTATOE,

BY SOLANUM TUBEROSUM.

I KNOW of no vegetable, generally considered, (wheat excepted) more valuable to the inhabitants of Britain than the potatoe. The easy culture, speedy production, and the many ways in which it may be applied for the benefit of man, justly entitle it to a place in the first rank of cultivated vegetables. In a retrospect of the last thirty years, the most indubitable evidence presents itself of the astonishing effects produced by the culture of the potatoe. Many, very many acres of land that formerly were not considered worth the labour required for their cultivation, have been increased in value to a great amount. In most cases, potatoes have been the principal crop for bringing such land to its present improved state. In places remote

from populous towns, they have been extensively appropriated to the feeding of cattle, a practice, when judiciously managed, which is well calculated to yield a fair profit to the grower, and enable him to improve his land by the extra manure made by the cattle while so fed. It is not my intention to enter on a general history of the potatoe, but merely to throw out a few hints respecting its culture and application. There are now so many sorts of potatoes, and those so well known, that the merest tyro cannot be at a loss to know which he should grow. I will suppose, then, in the first place, that an early crop is required, (I do not include forced potatoes, as they must be considered exceptions to the general rule) and, for general early production, I know of none better than the Early Manly, Goldfinder, and Ash-leaved Kidney. For a good full crop, the Early Shaw is an excellent potatoe, coming in about a fortnight after the others. Next follows the Early Champion, an excellent potatoe, retaining its properties through the winter months, which is followed by various later kinds, as the different sorts of kidneys, &c. too numerous to be mentioned here. Much has been said on the culture of the potatoe, particularly as the manner of cutting the sets, and planting, but it is impossible to lay down a rule applicable to every case. Local circumstances will ever suggest deviations to the experienced grower, and experience alone will enable him so to order his arrangements that he may look forward with confidence, to a favourable result.—Some persons recommend light or shallow digging, or ploughing, with but little manure, for potatoes. By this method, quality may be obtained, but quantity is out of the question. Others propose deep culture, with plenty of manure, by which a much greater quantity may be obtained; but it is best to avoid both extremes. For early crops, I have found it much the best to dig or plough in the manure in autumn, giving the ground another moving in the spring, which renders it lighter, and diffuses the manure more generally through the soil. I am of opinion the ground cannot be worked too much for potatoes, particularly if it be of a binding quality. As respects the sets, I should say, take them from potatoes that are not exhausted by growing in the heap. Give them sufficient room between the rows, that they may have the benefit of light and air around them, giving them sufficient mould to cover the roots, and to prevent the tubers from becoming green. By proper attention to these rules, a good crop may reasonably be expected.

I believe, in some instances, good crops have been obtained where they have not been earthed at all, but it is not a good plan, as there is always a much greater proportion of green tubers in crops not

earthed than in those that have been earthed in a proper manner, which of course affects the value of the crop very materially. In early crops, there is not that necessity for moulding up as in later ones; the former, being of more humble growth, and not remaining so long on the ground, are not so liable to be turned green by the influence of light, being generally taken from the ground before they have found their way through mother earth. If these hints meet your approbation, I will submit a few more on the culture of potatoes for feeding cattle and pigs, and on their application to domestic economy.

ARTICLE VI.—CULTURE OF POTATOES,

BY MANCUNIENSIS.

I AM happy to see that my communication of a new mode of forcing potatoes has proved interesting to some of your correspondents. I have great pleasure in explaining it further, as requested by one of them in a former number.

The mode I should adopt, would be to take off the top of an old hot bed, fork the dung up, and then put a layer of soil, a few inches thick, upon which I should plant some small whole potatoes, or as they are generally called "Chats," covering them once with a thin layer of soil, and one of litter. Then I should cover the litter with gorse or heath, and the whole with a good layer of soil. The heat which will arise from the litter, at the bottom of the bed, will soon cause the sets to sprit, and the shoots will push up through the layer of soil and litter above them, and the gorse or heath will prevent the top soil from falling upon and crushing them.

My informant's resource was more simple, as he, instead of an old hotbed, used only the natural soil. By digging the trenches deep, he effectually drained the bed, which is very material (for if the sets got too wet they would rot,) and he was also able to plant them considerably below the surface of the ground, which would render them less exposed to the weather, and which of course could not be with a hotbed, unless one were sunk in the ground for the purpose. The time for planting is as early as possible after the potatoes have been taken up, and of course the earlier the sets are planted, the earlier will the new potatoes be ready. There will be very little trouble about the subsequent culture, as when once planted they need not be touched until the time for getting them up arrives, which can only be ascertained by taking off a small portion of the bed and looking at them.

The culture in a hotbed, it will be observed, is precisely similar to that in the open ground, and the only advantage is, that in a hotbed the heat from the dung will cause the sets to sprit sooner. The principal requisite is to cover them up well, to prevent the frost from touching them, and to keep the rains off them.

I hope your correspondent will be successful in his endeavours to grow them.

November 16, 1833.

FLORICULTURE.

ARTICLE VII.—CULTURE OF THE NATIONAL ORDER IRIDEÆ.

BY ARTHUR.

THE few hasty remarks I made on the culture of the Natural Order Amaryllideæ, met so flattering a reception as to induce me, in compliance with the request of H. L. T., to submit a few more on the culture of the CORN-FLAG TRIBE, (IRIDEÆ,) which in consequence of their beauty and easy culture, are universally cultivated.

The plants of this order are generally natives of the Cape of Good Hope, Europe, and some parts of North America. The tropical countries produce very few species, and though *Marica* and *Moræa* are found in hot climates, by far the greater part inhabit more temperate regions. Their medical properties are very trifling, for, with few exceptions, they are more remarkable for beauty, than utility. The Iris Florentina and Germanica produce the fine violet scented powder and root, sold in our chemists' shops under the name of "Orris root," or "Iris root." The seeds of the Iris, pseudo acorus, when wasted, very nearly resemble coffee in quality. Saffron is the dried stigmas of a Crocus, which possesses a valuable colouring matter, to which the name of Polychroite has been given. These properties, with a few more of less note, may be considered as the chief uses of Irideæ. The Genera of this order, are as follows,

Iris,	Cypelia,	Pardanthus,
Moræa,	Vieusseuxia,	Bobartia,
Marica,	Homeria,	Sisyrinchium,
Streptanthera,	Spatalanthus.	Renealmia,
Patersonia,	Lapyrousia,	Sparaxis,
Orthrosanthes,	Anomatheca,	Tritonia,
Witsenia,	Babiana,	Ixia,
Aristea,	Antholyza,	Melasphærula,

Ferraria,	Anisanthus,	Heperantha,
Tigridia,	Watsonia,	Geissorrhiza,
Herbertia,	Gladiolus,	Trichonema,
Galaxia,	Synnotia,	Crocus.

CULTURE OF THE GENUS IRIS.—The name of Iris was given to the plant by Theophrastus and Pliny, from the variety of its colours. This well known but beautiful genus is rarely met with in America, but it abounds in Europe. The chief part are tuberous rooted, and are propagated by dividing the roots, but some are bulbous. The modes of culture, although in almost all cases simple and easy, vary considerably. Some species delight in exposed, and others in shady situations, some in dry and sandy soils, and dry situations, others in rich loamy soils, and moist situations, the greater part are perfectly hardy, but some few require shelter, having a variety of peculiarities which renders it necessary to mention the species rather particularly. A great number of them will grow without any particular care, in almost any soil and situation, as the hungarica, Nertchinskia, lurida, germanica, graminea, Xyphium, nepalensis, &c. &c. The hungarica does very well in a pot, but requires, in that case, to be planted in a rich and good soil. The germanica produces the colour called "Iris green," to obtain which the flowers are macerated, and having been left to putrify, chalk or lime is added. This species, in connection with the florentina, are planted about the graves in Florence, as a token of respect to the deceased. The flowers of Xiphium have a scent greatly resembling coriander seed; the xiphioides is a very free seed bearer; it is bulbous, as well as xiphium; the bulbs are imported annually from Holland, and should be planted early in the autumn. The biglumis, sisyrinchium, pallida, arenaria, tenax, persica, &c. &c. must be planted in a light sandy soil, and in a situation where they will receive but little moisture, being for the most part very impatient of wet, particularly the pallida, arenaria, and tenax. The pallida should also be planted in a sunny situation, where it is sheltered a little from cold winds, it being more tender than some of the other species. It is often called the Dalmatian Iris. The tenax grows in open parts of the woods of North California; from the veins of the leaves, the native tribes make fine cord, which is converted into fishing nets, and for its buoyancy, great strength, and durability it suits this purpose admirably. The persica will blow in water glasses like hyacinths, but it flowers much stronger in a pot of sandy loam, sandy peat, or even pure sand; it has a most delightful fragrance when in blossom, and a flower or two expanded will scent the whole apartments. It is not hardy, although it will blow well

in the open air, but it requires a degree of warmth and shelter.

The bicolor, crassifolia, verna, dichotoma, aphylla, tuberosa, &c. &c. thrive the best, if planted in a mixture of equal parts of rich loam, and leaf mould, or peat. The bicolor is not perfectly hardy, but will require the shelter of a frame in cold weather. Its flowers are beautifully delicate, and soon become faded, if exposed to the powerful influence of the mid-day sun; it is, therefore, advisable to place it, during the time of flowering, on a northern aspect, where the delicate blossoms will continue for some time. The Crassifolia requires the shelter of the greenhouse. The Dichotomo or Scissor-plant should be planted in a sheltered part of the flower border, where it will not receive much moisture. The Aphylla, is far from being common; I scarcely remember meeting with it in any of the gardens I have had the pleasure of visiting. The scent of the flowers greatly resembles that of the flowers of the orange tree. The Tuberosa is found growing wild both in England and Ireland; when cultivated in our gardens, it very seldom flowers; perhaps this, in many instances, may proceed from the want of a peculiar treatment. It ought always to be allowed to stand three years at least in the situation where it was first planted, for if it be often removed it suffers damage. Towards the end of August, the fibrous roots begin to grow; after that time, if the soil be disturbed near the plant, the roots will be damaged and flowering prevented. The situation should be warm, sunny, and free from wet. When it produces seeds, let them be sown immediately after being gathered, in the same kind of light soil in which the parent plant grows. In propagating by off-sets, dig up the tubers as soon as the leaves of the plant turn yellow in summer; as soon as they are taken up, and sufficiently divided, plant them immediately, for if dried in any degree, they receive injury. The depth at which they are to be planted should be six inches.

The Reticulata, Susiana, &c. require a light soil, but it should be made rich. The former of these needs the shelter of a pit, or frame in winter. It is usually increased by off-sets, but occasionally ripens seeds, if the plant be protected from wet, and freely exposed to a pure air when in flower. The latter may be planted in a somewhat stronger soil than the other, in a situation exposed to the full blaze of the sun; and where the air is pure. Moisture is particularly injurious to this species, often proving fatal. In a very wet or severe season, the roots often perish; it is advisable to keep a few in pots, either in a frame or the greenhouse, during winter. The mode of propagation is by cutting off pieces of the roots, for it very seldom ripens any seeds.

The Amœna, Sambucina, Ochroleuca, &c. &c. thrive best, when planted in a good rich loam. The Sambucina is calculated for a shrubbery rather than small flower borders; all the aforementioned three in connection with virginica, flavissima, spuria, and several others require planting in a moist situation, or they do not grow to any degree of perfection. The Cristata also thrives best in a moist situation, but it must be planted in bog earth (not peat,) and if covered with a hand-glass or some other kind of covering in severe weather, it will do well. The Chinensis has a complete creeping root; it flowers well in the greenhouse, and does very well in the open border. The Clandestina requires the heat of the stove, and should be potted in sandy loam and peat.

The best for forcing are Susiana, Persica, and Chinensis.

All the tuberous rooted species are propagated by dividing the roots, for the most part in the autumn, and the bulbous species by off-sets.

ARTICLE VIII.

ON VARIOUS SPECIES OF SALVIA, AND A KENNEDIA RUBICUNDA, AND THUNBERGIA ALATA.

BY MR. F. F. ASHFORD.

The unfailing success which I have experienced in cultivating the various species of that most beautiful genus the Salvia, induces me to trespass on your valuable pages, by briefly detailing my method of growing and flowering to great perfection, this elegant tribe of plants. I perfectly agree with your able correspondent, G. T. T. vol. I, page 773, who says, that when writers notice the cultivation of any genus or species of plants, they should at the same time give the natural history, and botanical characters of the said genus or species.

Salvia is a very extensive genus, consisting of upwards of one hundred and thirty species, natives of each of the four quarters of the world, and of course furnishing inmates for the hothouse, greenhouse, and flower garden, with three species, and four varieties for culinary purposes; namely, S. officinalis, or common sage, with two varieties, the varigata, and tenæior, the S. sclarea, or common clary, and S. hormium, and two varieties, violaeca, and rubra; they belong to the second class and first order, Diandria, Monagynia, of Linneus, and the natural order of Labiateæ, of Jussieu, (see page 410, vol. II.) The word Salvia is taken from Salous, or Salvam, safe, alluding to

the medicinal qualities of the genus. The generic botanical characters are the following: Calyx is monophyllous, wide at the mouth, and bilabiated. Corolla monopetalous, tubulous, below and ringent above, having the upper lip concave, and indented, and the under one broad and trifid. Stamina two short filiments, split into two parts, one of which supports the anthera. Pistillum, a quadrifid germen, a long slender style and bifid stigma. Pericarpium none, Semima four roundish ones, lodged in the calyx. All the shrubby and under shrubby kinds, both hardy and tender, are durable in root, stem, and branches, and remain in leaf the year round, but the herbaceous kinds are furnished only with stems in summer.

The culinary species and varieties, being already ably treated on by Mr. Paxton, in vol. II, pages 348, and 443; it would be superfluous to repeat their culture here. The cultivation of them for flower borders will serve for a subsequent communication, in connection with other plants, and I shall now confine myself to their treatment for flowering in autumn, in as brief a manner as possible.

Instead of striking them in March, as recommended by your correspondent, Sage, vol. I, page 438, I should defer it till the middle of May, for when struck so early in the spring, they not only require a deal of extra trouble, but as G. A. L; page 547, justly observes, they become straggling and unsightly; and very often, when so large, they become stunted at the roots, and then the Acarus, or red spider infests it more than ever, causing the leaves to drop off and straggling stems to appear in view. After the cuttings are prepared and inserted into pots of sand, place them in a working cucumber frame till they are struck; then pot them into forty-eight sized pots, and replace them in the frame, shaking them, when the sun is powerful, till they have taken roots, supplying them with water when required. Here let them remain, till they have grown a few inches higher, when they may be removed to a sheltered situation in the greenhouse for a few days. Harden them to the air by degrees, and eventually let them be placed in a house or cold pit where they can receive top air night and day, allowing only the lights to be on in heavy or continual rains. It would be a great advantage to let them be screened at their roots, by a wall in front, from the mid-day sun, which might scorch and injure their fibrous roots. All the attention they now require, is to be constantly supplied with water, tying them to neat sticks, as they advance in growth. Care is also necessary to pot them as often as they require it, and before the roots begin to mat, for on these points, future success depends. I should have stated, that when they have grown six or seven inches high, the tops must

be pinched off, and those side shoots also stopt at the fourth eye.

In the middle of August, remove them to a house of fifty or fifty-five degrees, where they must receive plenty of air, light, and water, or else they will still be drawn, lose their leaves, and become unsightly. They should continually be syringed with pure water, and sometimes with a weak solution of sulphur and tobacco, in order to keep down the ravages of the Acarus, which should not be allowed to make its appearance, as it will do, now they are brought into heat, if due care be not taken. Should they gain a head, all previous care will have been useless, and leafless, plants or yellow spotted leaves, will be the reward of all our pains, expense, and trouble.

In the beginning of September, they should receive their last potting, and if due attention has been paid them in respect to air and water, and the destruction of the spider, fine flowering plants, well clothed with green leaves, will be our reward.

The S. involucrata, and S. pseudo-coccinia with some others, throw out small flowering stems from the main one, which, if they be pinched off as soon as the flower spike is perceived, will add strength to the side ones, and thus a fine head will be produced.

I do not agree with Mr. Heacy, vol. I, page 732, in having the Salvia splendens in flower the whole year, as I consider varieties of colour and of form will look much more handsome and inviting. I beg to say, I quite acquiesce in the opinion of Mr. Bedell, vol. I, page 731, in the imposing effect of this Salvia being trained with a tall stem and fine large head, but I think they would appear to equal advantage in a conspicuous part of the conservatory.

November 11, 1833.

NATURAL HISTORY.

ARTICLE IX.—ON THE FORMATION AND ARRANGING OF A HERBARIUM.—By F. F. Ashford.

Having noticed that a correspondent "J. K." in Vol. 2, page 426, made enquiries respecting preparing specimens of plants for making a Volume, I sit down to write an answer, so far as my humble abilities will permit, at the same time soliciting other persons to offer their views on this interesting and useful topic.

When the earth begins to put on its green robe, the trees to bud, and the flowers to open, we should look around for objects, which, in fact, are always to be found more or less at all seasons of the year,

but yet an instant of delay may be the loss of a whole year for botany. My design is to state how any one may prepare, dry, arrange, and preserve specimens of plants in such a manner as that they may be easily known and determined. This distinguishes the true botanist from the mere herbarist or nomenclator. In a word, I propose to form a Hortus Siccus which we call a collection of dried plants, serving to put us in mind of the plants we have once known, though it gives us a poor idea of those we have never seen before.

First, it will be necessary to provide a quantity of gray paper, and nearly as much of white, of the same size, and pretty strong, without which the specimens would rot in the gray paper, the plants or the flowers would lose their colour, by which they are most usually known, and which is most pleasant to behold in the collection. A press must also be prepared, and when these preparations are made, the following rules may be observed, in order to prepare the specimens, so as to preserve and know them again.

The precise time to gather the specimens is when they are in full flower, or rather when some of the flowers are fallen, to give place to the fruit. It is at the time when all the parts of fructification are visible that endeavours must be made to gather and dry the plant.

Small plants may be taken whole with their roots, which must be so brushed that no earth remains. If the earth be wet, it must either be dried in order to be brushed, or else washed off. In this case, it should be well wiped, and dried before it is put in the papers, without which it would infallibly rot, and injure those near to it. The root need not be preserved, unless the plant be small, as the Salix herbacea, or unless it have some remarkable singularities. Nature, which has done so much for elegance and ornament in the form and colour of plants, in whatever strikes our sight, has destined the roots entirely to useful functions, being concealed within the earth. To have given them an agreeable structure, would have been to hide a light under a measure.

Trees, and all great plants, can only be had by small specimens, but then the specimens should be well chosen, and so as to contain all the constituent parts of the genus and species necessary to know and determine the plant from whence it is taken. It is not sufficient that all the parts of the fructification are distinguishable, though these would be enough to distinguish the genus, the characters of the foliation and ramification must be sufficiently visible to determine the species of the said genus, which are nearly alike in flower and fruit. If the branches be too thick, they may be made thinner by cutting them nicely with a sharp knife underneath, as much as may be with-

out cutting and mutilating the leaves. When the leaves and flowers do not come out at the same time, or grow too far distant from each other, take a little branch in flower and another in leaf, and place them close together in the herbarium. You thus have before you different parts of the same plant, sufficient to give a complete knowledge of it. As to plants where leaves only are to be found, the flower being past or not yet come, you must patiently wait till they show themselves, in order to be fully acquainted with them, a plant being no more certainly known by its foliage than a man is by his clothes.

Such is the choice to be made of what we gather, and we must choose our time when to gather. Plants gathered in the morning or evening, when the dew is on them, or in the day time when it is wet, will not keep. We must choose a dry season, and the dryest and hottest time of the day, and if the least moisture be found on them, recollect they will certainly not keep.

When they are gathered and brought home, preparations must be made as soon as possible to arrange them in your papers. For this purpose, lay down one sheet of gray paper, and upon this half a sheet of white; then place upon it the plant, taking great care that all the leaves and flowers are well opened and laid out in their natural situation. If it be a little withered, without being too much so, it will generally spread out better with the fingers and thumb. But there are some that are rebellious, and that start up on one side whilst being arranged on the other. To prevent this inconvenience, I place leads upon those parts which I have put in order, whilst I am arranging the rest, so that when I have done my specimen, it is almost covered with these pieces, which keep it in its proper situation.

I then place another half sheet of white paper upon the plant, pressing it with the hand to keep the plant in its position, bringing the left hand that presses gradually forward, and at the same time taking away the leads with the right. I then put another sheet of gray paper upon the second white paper, pressing it all the while lest it lose its position. Upon the gray paper, place another of white, and upon this another plant arranged and covered like the former, till you have placed the whole harvest, which ought not to be too large at once, lest your task be too laborious. And take care that your paper do not contract too much humidity during the drying, which would infallibly spoil the specimens, unless you hastened to change the papers, which must be done from time to time till they are perfectly dry. Your pile of plants and papers thus arranged must be put in the press, without which the specimens will not be

flat and even. Some are for pressing them more, others less, but experience will teach what is proper as well as how often the papers are to be changed, without taking unnecessary pains. Lastly, when the plants are quite dry, put them into sheets of gray paper, without white ones between, for which there is no occasion, and thus is commenced a herbarium which will continually increase, if there be assiduity on your part with your knowledge, and at length contain a vegetable history of the country.

Specimens of Ericas, Brunias, and such like delicate leaved plants, are very apt to lose their leaves in drying, and very often after they are dried. The remedy in this case is to dip the specimens overhead into scalding water, and then to dry them, but not before a fire, proceeding as above.

Specimens of all plants excepting succulents may be dried in a few hours, by placing them between hot sand-bags, in a moderately heated oven. Specimens of all succulent and other mucilaginous plants are very difficult to dry on the above methods, owing to the abundance of sap contained in the stem and leaves; but this may be remedied by observing the following mode, by which I have dried a great quantity of this sort. Provide some coarse brown paper for the purpose, and after arranging the specimen for drying, cover it with five or six layers of the same sort of paper; then, with a well heated iron, proceed to iron the covering paper, till all the moisture is drawn out of the specimen. Sometimes the papers will require changing, and the iron re-heating before the drying is finished.

It now only remains for me to speak on the arrangement of the specimens, after they are dried in the Hortus Siccus, which I shall do as briefly as possible. The herbarium should be a thick Volume of the folio size, composed of cartridge paper, well supplied at the back with guards, so that when the Volume is filled with specimens, the front may not be wider than the back, which would be the case without them. There should also be four clasps on the outside edges, two on the front, and one on each end, with different links to keep the Volume close while filling, and when full. In arranging them in any particular manner, must be left to the person's taste, some arrange them in alphabetical order, some by the natural system, some one way and some another. I have arranged mine by the Linnean classification, if arranged in any of these ways, all the species of one genus must be kept together, and not begin till a sufficient quantity is collected, but if promiscuously, they may be fastened down as soon as dried. When the arranging is fixed on, and a sufficient number on hand, proceed to fasten them down with

narrow slips of dark green paper wherever they may require it, and the descriptions should be written in the following manner :

No. 67,
CAPPARIS ZEYLANICA
STOVE EVERGREEN SHRUB,
CEYLON, 1819. WHITE.

Take care always to keep the collection very close, and a little pressed, without which the specimens, however dry they may be, will attract the humidity of the air, and again get out of form. It must also be kept in the driest part of the house, and rather on the first than the ground floor.

The press should be composed of two mahogany boards, eighteen inches square and one thick, and a screw, which performs the pressure on the top of the upper board where there is a small piece of iron let in to keep the screw from making any indenture.

In answer to M. K. Vol. 2, page 29, I beg to say that the specimens may be laid in as natural a manner as possible, but still if the leaves are not straight, and the petals laid out regularly, how can the generic or specific distinctions be ascertained, or the class and order be distinguished ? I therefore hold good what I have stated above, and also what appeared in the *Horticultural Register*, Vol 1, page 742.

ARTICLE X.

COLLECTIONS AND RECOLLECTIONS.

A Curious Horticultural Anecdote.—When Sir Francis Carew had rebuilt his mansion house at Beddington, in Surrey, he planted the gardens with choice fruit trees. Here he was twice visited by Queen Elizabeth; and Sir Hugh Platt, in his garden of Eden, tells a curious anecdote relating to one of these visits. "I conclude," says he, "with a conceit of that delicate knight, Sir Francis Carew, who, for his better accomplishment of his Royal entertainment of our late Queen Elizabeth, led her Majesty to a cherry tree, whose fruit he had of purpose kept back from ripening at least one month after all cherries had taken their farewell of England. This secret he performed by straining a tent, or cover of canvas over the whole tree, and wetting it over with a scoop, now and then, as the heat of the weather required; and so, by withholding the sun-beams from reflecting upon the berries, they grew both great and were very long,

before they had gotten their perfect cherry colour, and when he was assured of her Majesty's coming, he removed the tent, and a few sunny days brought them to maturity. I. K.

To Prevent Snails from ascending fruit trees, a paste should be made of charcoal powder and common oil, to be laid on the trunk of the tree, in a circle, a few inches from the ground, which presents an obstacle that snails cannot surmount.

Asparagus Beds.—It is recommended to form asparagus beds, by means of very low priced cotton, whence it has been stated that an astonishing profit has been derived. Silk and wool, it is said, will produce the same effect.—From the *Journal des connaisances Usuelles et pratiques.*

Buffon, when he began to write on ornithology, knew but of 800 birds, but imagined that there might be from 1500 to 2000; full 6000 varieties are now known, and new species are being added every year.

If Quick Lime be put upon land, which from time immemorial has produced nothing but heather, the heather will be killed, and white clover, trifolium repens, will spring up in its place.

Rapid Reproduction of Insects.—It is calculated that one musca carnaria, produces 20,000. The larva of many flesh flies, will devour so much and grow so rapidly, as to increase their families two hundred fold; five days being sufficient to mature them. A single individual of the aphis species is said to become the progenitor of descendants to the enormous amount of 5,904,000,000, and that in one year, it gives rise to twenty generations. The ravages of the caterpillar are immense, as gardeners well know. A female moth lays no fewer than 400 eggs, producing a most destructive family, in its efforts to maintain itself.—*Jesse's Gleaning's in Natural History.*

To increase the odour of Roses.—Plant a large onion by the side of a rose tree, in such a manner that it shall touch the root of the latter. The roses thus produced will have an odour much stronger and more agreeable than such as have not been so treated, and the water distilled from those roses is very superior to that prepared by means of ordinary rose leaves.—*From the French.*

Roses.—Roses are great ornaments to pleasure grounds, but a great deal of their effects depends upon the manner in which they are planted. To flower well, and attain their full perfection of size and colour, they should have abundance of air and light. And to look well, they should be grouped together in such a manner, as to form a pyramid, rising gradually in height, from the dwarf roses round the base, to the tall standards that form its apex. The varieties of roses

are almost endless; it would be useless to enumerate them, and we shall only observe, that one of the most beautiful dwarf sorts, is Lee's scarlet perpetual, which is generally in flower seven months in the year. The best for standards are the different varieties of Noisettes and Boursalts; the latter having also the advantage of being remarkably hardy and free growing.—*Farmer's Magazine.*

MODE OF DESTROYING ANTS in pleasure grounds, or in any pasture land. Take a heavy rammer, or any heavy instrument of the kind, and beat the hillocks well down, when very wet; let them be even with the surface, the best time is spring or summer, when the ants are near the surface.—*Agricultural Review.*

TO DESTROY EARWIGS.—This destructive insect to the florist may be destroyed in the following manner: take some small sticks, and upon the top of each put the bowl of a tobacco pipe, free from the smell of the tobacco, and place them among the flowers infested. In the morning, you will find an insect or two in each bowl, which you can shake out and destroy. I. K.

RECEIPT TO KEEP APPLES.—It seems not to be generally known, that apples may be kept the whole year round, by being immersed in corn, which receives no injury from their contact. If the American apples were packed among grain, they would arrive here in much better condition than they do at present.—*Atlas.*

NARCISSUS.—I should be obliged to any one of your correspondents or readers, who would give me a few hints as to the culture of the above plant, with a list of the different varieties. I. K.

RANUNCULUS.—There is a species of this handsome flower in our neighbourhood, which is different in its habits from the sort generally cultivated, though alike in flower and foliage. It is called Seedling Ranunculus, and as it is but in few persons' hands, it is not much known. The method of cultivating it, is to sow the seed in pots or boxes, in April, which will soon come up; and as soon as the leaves of the plant turn yellow, take them and preserve them very dry, planting them the next February into the mould, and you will be sure to have a good bloom, and perceive some most beautiful flowers. The plants then seed very freely, but the old roots are not worth planting again, for not one out of ten of them will flower again. I. K.

SEED CORN.—I believe it is universally recommemded to change the seed from time to time, as it is found to deteriorate when long continued from the same. I will not enter into the question; but will only ask whether it is not usual for the farmer to get the best sample he can, without at all adverting to the soil or climate in which it has been grown. Now we know that by high cultivation and care,

the quality of plants, particularly of the natural order *Gramineæ*, have been greatly improved. Therefore it would seem self evident, that we should introduce into our soil the seed, grown on land of a quality not quite so good as our own—or brought from a climate not quite so genial. If seed grown on a richer soil, or in a better climate than our own, be used, it seems quite natural that it should degenerate. There are individuals who stoutly deny, from their own experience, that the seed constantly grown from the same soil does degenerate, and perhaps, they may not be wrong, if by accident the seed first introduced was from an inferior soil.

The subject is one of much importance, and well worthy of some experimental trials, in order that the truth may be ascertained. Should any of your readers devote their attention to this subject, I hope they will communicate the result. C. M. W.

London, December 5, 1833.

Carlisle Codlin Apple.—On a second visit into Westmoreland and Cumberland, I was induced, by the uncommon fineness of the apple tart at a friend's table, to inquire of what sort of apples it was made, and found it was the "Carlisle Codlin." The fruit was remarkably pulpy, almost a jelly, and of a rich reddish colour—an early and good bearer. Being afterwards at Carlisle, I found my friends there fully sensible of the quality of their local codlin, and holding very cheap their neighbour the Keswick Codlin, which is common in our southern lists, and is included, I observe, in your list of select fruits of this month.

The Carlisle Codlin has the peculiarity of being propagated by slips, and deserves to be better known than I presume it is in the south. Viator.

December 10, 1833.

PART II.

REVIEWS AND EXTRACTS.

REVIEW.

ILLUSTRATION OF VEGETABLE PHYSIOLOGY,

Practically applied to the Cultivation of the Garden, the Field, and the Forest,

CONSISTING OF ORIGINAL OBSERVATIONS COLLECTED DURING AN EXPERIENCE OF FIFTY YEARS.

BY JAS. MAIN, A. L. S.

12*mo.*—328 *Pages.—Price* 8*s.—Bound in Cloth.*

FROM the well known abilities of Mr. Main, we anticipated on the first announcement of this work, that the public would be furnished with a mass of useful and interesting knowledge. We were satisfied that so close an observer of nature could not have been practically engaged for fifty years, without making a multitude of important observations. This anticipation has not been disappointed, for on carefully looking over the pages of his work, we have been much pleased with the many pithy remarks and judicious directions therein contained. The author commences with the "Elements and structure of vegetation," and proceeds to shew the "organization of plants," and the nature of "vegetable life." He then enters more minutely into the subject, explaining the distinctions of vegetables, as the "structure, manner of growth," &c. of monocotyledonous plants. The reproductive property, constitutional character, special habit, &c. of the various divisions or orders of dicotyledonous plants. Then follow the minutiæ of "organization," as the structure of the seeds, root, collet, stem, pith, wood, bark, pendulous stems, climing stems, creeping stems, progressive growth, circulation of the sap, seat of vegetable life, origin of buds, and appendages of the stems of plants. Under the "seat of vegetable life," the author gives some peculiar ideas of his own, respecting the life being a distinct member of the plant, which is always found between the wood and the liber. As this is to us an entirely new theory, we subjoin an extract to shew the author's views on the subject, that our physiological friends may judge for themselves.

"Every developed member of a tree is imbued with the vital principle in its early existence, and retains it while in the act of expansion, but no longer. The bark is an exterior and the wood an interior increment; both have been inflated into form, and forced into position by the life; but as soon as the form is complete, and the position imposed, they are deserted by it, and when they cease to partake of its influence entirely, they succumb to decay."

"There are, therefore, two states or degrees of vegetable life. The first is always present in those members which are capable of amplification, or are in the act of accretion, *i., e.*, expanding from a small to a large volume. The second is that state in which it is only conservative, but without the power of a further growth of the members preserved by it. The first it is deemed proper to designate by the name of *vital envelope*, whence proceeds every new member of trees, shrubs, and many herbaceous plants. The second is, that state of the bark and alburnum which, having but recently come into full form and magnitude, serve as conductors of the fluids of the system for a certain time, but from which the actual life has for ever fled."

"Where then does the living principle reside? In the pith? No; in the wood, or in the bark? No, in neither of these, but it is always found at all times between the liber and the alburnum, slightly attached to both, but united to neither; it is reasonable, therefore, to conclude, that it is a *distinct member* of the system."

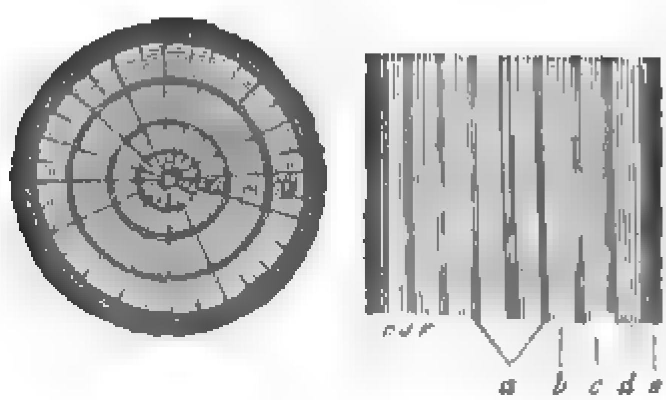
This slender body of vitality, or *vital envelope*, is constitutionally compound, not simple, as such a thin tissue may be supposed to be; containing the rudiments of both roots and buds; and moreover is the source of all accretion, whether as to magnitude or number of the parts produced.

"The foregoing idea of the existence of a distinct vital member, whence all new accretions proceed, is directly opposed to the modern doctrine of the "organisable property" of the elaborated sap of plants. The idea is founded upon the general law of vegetable nature; for where do we find the most insignificant vegetable body come into visible existence without having a pre-existing embryo or rudimental atom, whence it derives its essential structure and qualities. There is no such instance in nature. Can the most minute species of *Fungi* spring forth without its propago or the smallest herb without a seed, or previously existing part of itself? Is the bark or wood self-productive? No: when either is destroyed it cannot be renewed but by the assistance of that vital member which is the origin of both."

Admitting, then, that plants and certain parts of plants possess

the property of perpetual reproduction and extension, a question follows :—How is this subdivision effected? In the case of bulbs it has already been stated, that the radicle plate is composed of an endless train of gems, which are developed in the order of their seniority; tubers are multiplied by divisions or branches; fibrous-rooted herbaceous plants perpetuate themselves by lateral offsets; but how is the annual subdivision of the vital envelope of trees accomplished? To this question a direct answer cannot be given, because the process is invisible; but we can gain a knowledge of the changes which take place between the wood and the liber of a tree, by making incisions through the bark, and marking the changes during the spring, summer, and autumn growth.

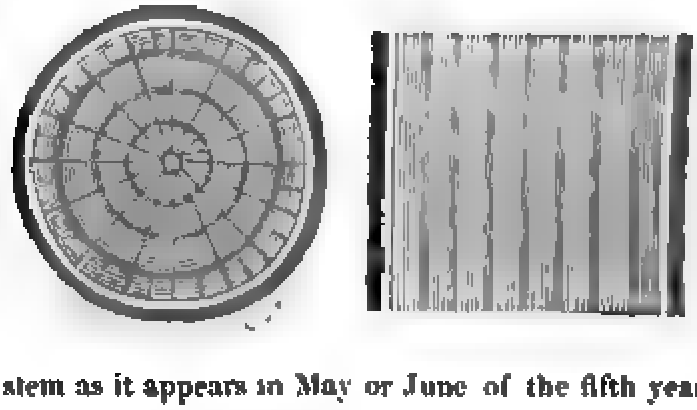
8



Transverse and perpendicular sections of a stem four years old; the latter through the pith. *a*, Pith and wood of the first year; *b*, *c*, *d*, layers of wood of the second, third, and fourth years; *e*, the four thin layers of bark.

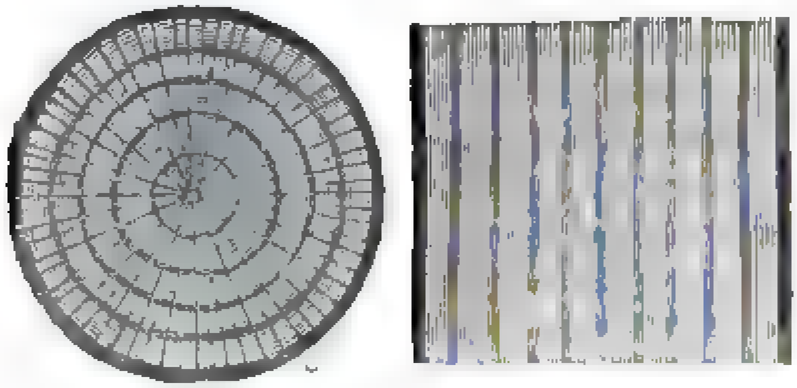
About the end of May, sooner or later, according to the favourableness of the season, similar sections of a stem of the same age will appear as Figure 9.

9



Sections of a stem as it appears in May or June of the fifth year. The white places showing the swelling cambium.

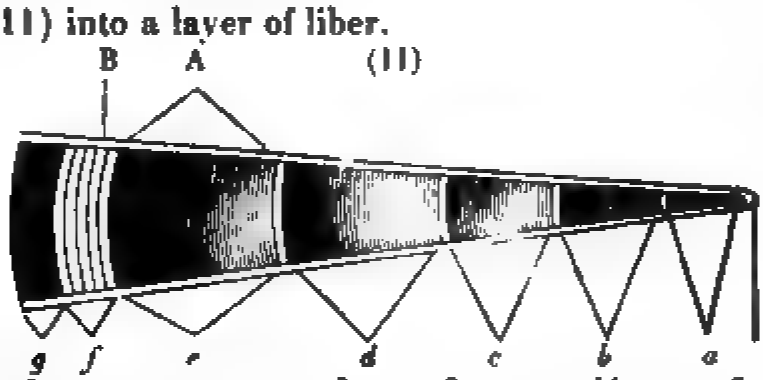
At the end of September, and in many kinds of trees much sooner, the sections appear as in Figure 10.



Sections of a stem at the end of the fifth year. The envelope and layers of the liber are too thin to be shown by the pencil.

Here we observe that a new concentric layer of alburnum has been added during the fifth summer, and also an additional layer of liber has been parted off, and placed close to that of the preceding year, and lined on the inner side with an almost imperceptible membrane or coating of gelatinous matter, which is the vital envelope, and from which the new growths of wood and liber of the next, and all succeeding years will be produced.

Judging, then, from these changes, about which there can be no doubt (because of them we have ocular proof,) we may conceive that the vital envelope is constructed of an indefinite number of distinct concentric layers, two of which are developed annually; the minor one (A, Fig. 11,) being inflated into alburnum, and the outer one (B, Fig. 11) into a layer of liber.



Segment of a transverse section of a tree five years old, magnified; *a*, growth of alburnum first year; *b*, the second; *c*, the third, *d*, the fourth; *e*, the fifth; *f*, five layers of liber, ideally magnified; *g*, epidermis and cuticle.

The appearance of the structure of the alburnum affords confirmations of the reasonableness of this idea. If we examine it as soon as it is formed, or in any future stage of its existence, we find the longitudinal fibres strongly and distinctly marked, and the minute vesicles of the cellular fabric between the fibres posited *horizontally;* showing that they are enlarged in the same direction, that is, advanced from the centre of the tree outwards.

This hypothesis is only objectionable, perhaps, on the ground of the difficulty of conceiving how such a mass of organization, forming the extended trunk of a full grown tree, can be contained in such a slender space as that between the liber and the wood of one of four year's growth. But this difficulty is not greater, indeed not quite so incomprehensible, as is the other supposition already alluded to, namely, that all increments are elaborated from juices and qualities inherent in the plant; or formed by accidental associations of certain electro-chemical bodies extractable from the earth, air, and water. The identity of the vital envelope, during summer, is visible and palpable; and if in winter it be only a cincture of transparent cellular matter, no doubt need be entertained of its subsequent expansibility. That vegetable matter appears in the first stage of its existence as a colourless homogenous mass is indisputable; and that it gradually gains consistency and organic form, may be easily believed, by examining an orange when first visible in the flower, and again when fully ripe and deprived of its juice. Besides, the accrescent powers, and indefinite limits of vegetation in this case, should banish incredulity; in many other instances it is equally surprising; witness the monstrous gourd, the majestic oak, the magnificent Banyan Fig; the latter shading acres of surface, all originating in an atom of a seed.

The new layer of wood, which is added on the old stem or trunk, ranges with the first layer of wood on the terminal shoots. On the latter all primary buds, and consequently branches, originate. The shoots developed this year, except water shoots,* are based on the alburnum formed on the last, and the buds formed in this year are seated on this year's alburnum, and on which they remain to be developed in the next or some following year. The pith, wood, buds, and bark of every shoot are all simultaneously produced.

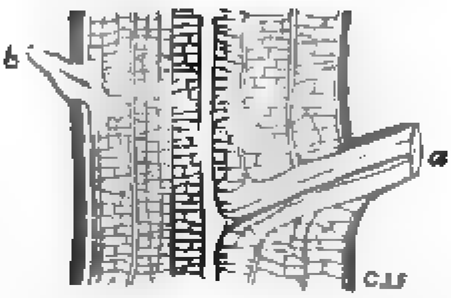
But all buds and branches are not *primary*. Such as are produced from an old stem, (*b*, Fig. 12) whether naturally or by consequence of pruning, may be called, for the sake of distinction, *secondary*.† These can have no immediate connection with the first formed layer of wood and pith and therefore invariably spring from the envelope.

* Water shoots are such as are produced on luxuriant growing shoots of the present year, frequently seen on the peach, apricot, and always on the grape vine.

† Botanists suppose that there are what they call "adventitious buds," that is, if buds come forth from other places than the axils of the leaves or bractea, they are adventitious and new creations. Their appearance, indeed, may be adventitious, but not their identity. If a bud can be produced without a rudiment, so may a whole plant.

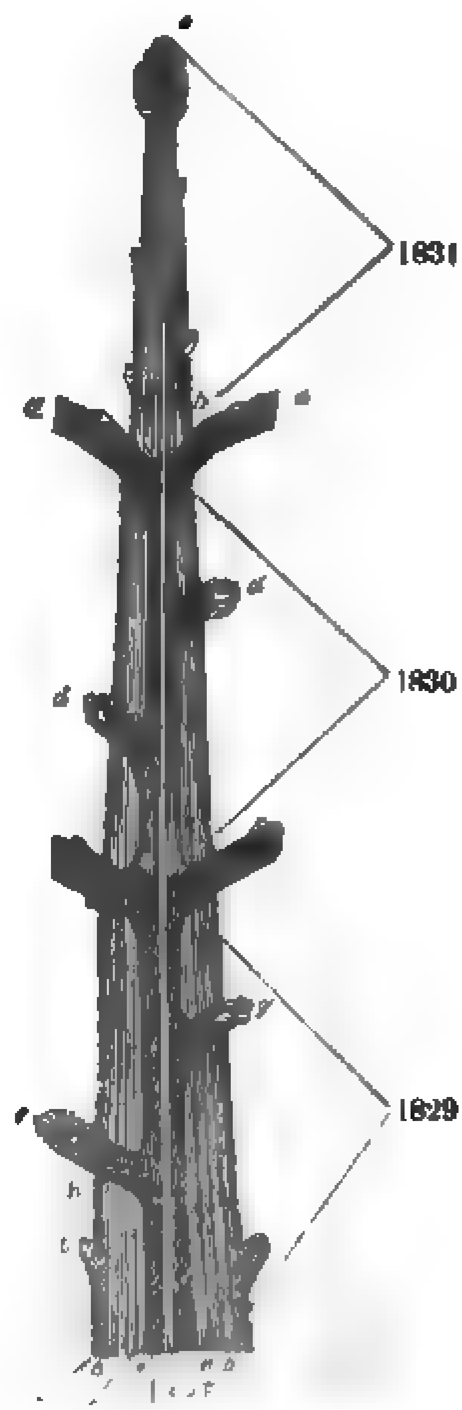
Example of a primary shoot *a*, and a secondary shoot *b*. The former is seated on the albumum of the first year, the latter on that of the third.

12



The following delineation represents the disposition of the layers of the wood and bark, with the places of the primary and secondary buds or shoots, on a section of an abbreviated stem of a tree of three years' growth.

12



1831, 1830, 1829.

This figure shows, that the lateral shoots *d, d, d, d,* and new layers of wood, *b, b,* on the lower part of the stem of the present year, are not attached to each other; and that the growth of the former can only affect that of the latter indirectly; nor can they (the shoots *d, d, d, d,* except the leading one *e*,) be supposed to assist the formation of the new zone of wood by ejecting fibres down into it; because their fibrous attachment is upon the alburnum, as at *e, e,* Fig. 5; that is, upon that division of the envelope which was formed into alburnum in the previous year. The young shoots which are elongated and bear the foliage of deciduous trees, are pretty regularly studded with buds along their whole length, though only a small number of them are developed in succeeding years. A few at the point always burst, namely, the leader and two or three laterals, part of the latter

being resolved into branches. Some of the lower situated are prolonged into spurs, and become flower buds, as at *f*, *g*, Fig. 5; many remain dormant, and are never developed, unless the stem be cut over immediately above their station.

From these circumstances it appears, in respect of secondary or tertiary buds springing from the vital envelope, that that member is possessed of these latent principles, which are put forth when surrounding circumstances favour their developement. It was this fact which induced an eminent French botanist to imagine, that vital gems floated in the sap; for on no other principle could he account for their inexplicable appearance. There are many trees having a fine smooth trunk, from which not a spray would be put forth while its branched head remained alive: but on being decapitated thousands of shoots would issue from the bole, even if its pith, and almost all its body of timber had gone to decay; a strong proof that the envelope contains the rudiments or principles capable of being resolved into buds as well as of radical fibres.

It has been supposed by some physiologists, that the medullary rays are the tracts of buds, and that all buds originate on, or proceed from the pith, but we have no certain evidence of the truth of these ideas; on the contrary we find, that buds of many kinds of trees issue from roots where pith has never existed; and medullary rays, or partitions rather, are abundant where no buds are ever, or can possibly be produced, viz. on the internodes of jointed stems; example, the grape vine. And it may be further observed, that in the plant just named, the greatest number of shoots, in fact every shoot, is ejected from the articulations where the pith is visibly interrupted. Of what are called medullary rays, we may observe further, that though known by this name, they do not all take their rise from the pith; as the stem increases in diameter, intermediate partitions come into existence at different distances from the centre, and appear to originate in the bark rather than the pith.

This view of the constitution of a tree shows us that it is not, as usually considered, an individual being. It has, indeed, a congeries of roots, a pith, a principal stem, and a general covering of bark, in common: serving the purposes of sustentation, support, and protection to the whole: but it has not only one—it is composed of many principles of life dispersed over its whole surface. A tree is a vegetable polypus: capable of unlimited division and subdivision of its parts without injury to, and without any notable diminution of the original. Not only is every seed, but every bud a perfect being, endowed with a living reproductive principle in itself; and whilst a

tree is considered as a vast assemblage of vital entities, requires to be treated as if only an individual.

After the author has treated largely on the *vital envelope*, the origin of buds and appendages of the stem of plants, he next proceeds to explain the cause of barrenness in trees; and the application of Physiological knowledge, in the operations of sowing, transplanting, propagation, pruning and training; then cross-impregnation, vegetable food, diseases of vegetation, insects destructive to plants, felling timber, grubbing, and longevity of trees, are each separately treated on; and a few remarks with an index conclude the Volume. Under the head "*pruning*" we have made another short extract, which we hope will serve to show the character of the work.

Ash timber is produced of superior quality by being grown in close order; its toughness and clearness of grain makes it enviable material for the coach-maker. Straight smooth sticks of ash, fifty feet in length, and from eight to twelve inches diameter, are highly prized by all machine makers. Oak and elm are best timber for hedge-rows. It is incredible how much elm timber can be raised in hedge order. And as the superiors are cut down, a constant succession of young stems are rising from the old roots. * * * The defective state of oak timber was attributed to want of pruning. The rotten stumps of branches which had been torn off by the wind, and which in their decay admitted water into the trunk, were said to be the cause of their disaster. Pruning was therefore had recourse to; but a bad style was introduced, viz. cutting off the lower branches at the distance of two or three feet from the bole. This plan was soon given up; not only because it disfigured the tree, but also because many of the stumps dying, the same defects followed this practice as were complained of before it was had recourse to. Close pruning was next recommended, but with no good result. A middle course is now adopted, namely what is called *foreshortening*. This method preserves all the branches, but the lower ones are kept back, by having their leading shoots repeatedly taken off. This is particularly suitable for hedge row timber, as it prevents the trees from overshadowing the land. It must be observed, however, that though this method gives soundness, it does not produce clearness of grain, which is the grand object of pruning.

Flowering Shrub Pruning.—All sorts of trees and shrubs having terminal flowers, as Magnolia, Camellia, Rhododendron, &c. are made floriferous, by checking luxuriance of growth, which is accomplished by the means practised for dwarfing fruit trees, viz. by grafting, budding, confining in small pots, limiting the supplies of water, or lowering the quality of the soil in which they are grown. Such as bear their flowers laterally, as the Almond, Myrtle, &c. should by pruning, be made to introduce numerous shoots in order to have a full bloom. In general, however, our flowering shrubs, as well as trees, are left to nature; little pruning being necessary except to keep them in form.

Thus much for the contents of a work, from the perusal of which we have derived both pleasure and profit, and which we think calculated to be very useful. Being illustrated with more than sixty wood-cuts, the whole is rendered perfectly intelligible.

EXTRACTS.

FLORICULTURAL INTELLIGENCE.

New and very Rare Plants, figured in the Periodicals for January.

CLASS I.—PLANTS WITH TWO COTYLEDONES. (Dicotyledones.)

ORDER LEGUMINOSÆ, or Pea Tribe.

Ad'esmia uspallatensis, Thorny Adesmia. A dwarf thorny shrub, rarely exceeding a foot in height. It has been raised from seeds collected iu Chili, by Mr. Cuming. The plant requires protection in winter, is fond of a light loamy soil, and may be increased by cuttings. The pods, when full grown, are particularly pretty, from the long feathery hairs with which they are adorned. The flowers are orange coloured, or deep yellow.—*British Flower Gard.*

Lupinus albifrons.—A shrubby species with purple flowers, lately introduced to the Horticultural Society's Garden, from California.—*Botanical Register.*

VERBENACEÆ.

Verbena sulphurea.—This pretty little vervain was raised from Chilian seeds, received from Mr. Hugh Cuming. It is apparently perennial, and forms a close spreading patch bearing sulphur coloured flowers. It appears to prefer a loamy soil, and grows luxuriantly in the open border during summer, but requires the protection of a spit or frame in winter. Cuttings of it root readily.—*British Flower Gard.*

RANUNCULACEÆ, the Crowfoot Tribe.

Hell'eborus od'orus, Sweet Hellebore. A very desirable addition to the scanty store of winter blowing flowers, lately introduced from Hungary, by the Horticultural Society. The flowers are green, and have a faint and most agreeable fragrance, which, perhaps, can be compared to nothing so well as to newly gathered Frontignan grapes, or to wine of Lunel. It thrives in a peat border, among bushes, where it is probably quite hardy, but being extremely rare, it would be better to protect it with a little litter.—*Bot. Reg.*

COMMELINEÆ.

Tradescantia pilosa, Hairy Tradescantia, or Spiderwort. This plant was raised from roots sent by Mr. Drummond, from Louisiana, to the Glasgow botanic garden. It has purple flowers, and requires similar treatment to the other hardy species.—*Bot. Mag.*

LOBELIACEÆ.

Lobelia puberula, Blue Downy Lobelia. This is a highly interesting addition to our garden Lobelias, and was introduced last year, by Mr. Drummond, who sent the seeds from Jacksonville, in Louisiana. The root is perennial; the flowers are small, of a bright purple blue, the spike rising to ten inches or a foot high.—*Bot. Mag.* The soil, we presume, should be light loam or peat.

COMPOSITÆ.

Helianthus speciosus, Showy Mexican Sun-Flower, Mr. Edward Leeds, of Manchester, Nursery and Seedsman, lately received a packet of seeds from the botanic garden, Mexico; the present plant is the only one which has yet flowered. The flowers are a rich orange colour, and very showy.—*Bot. Mag.*

CLASS II.—PLANTS WITH ONE COTYLEDONE. (MONOCOTYLEDONES.)

AMARYLLIDEÆ.

AMARYLLIS KERMESINA, Carmine Amaryllis. Roots of this pretty species were brought from Brazil, in the early part of 1833, by Lieut. Holland, of the royal marines, who presented them to Miss Street, of Penryn. The flowers are deep carmine colour, very rich. The plant has not hitherto shown any disposition to increase itself by off-sets. The soil in which it thrives very well is a mixture of loam, peat, and sand. It has hitherto been kept in a warm vinery. —*Bot. Reg.*

PANCRATIUM PEDALE, Long Flowered Pancratium. One of the most beautiful of the Amaryllis tribe, excelling them all in the extraordinary length of the flowers, which measure a foot from the base of the tube to the tip of the segments. The segments are very narrow and wavy, the colour is white. The bulb was sent by Mr. Barnard, from near Truxillo, to R. Harrison, Esq. Aighburgh near Liverpool, in whose hothouse it flowered.—*Bot. Reg.*

ASPHODELEÆ.

HESPEROSCORDUM CACTEUM, Milk-white Hesperoscordum. Found by Mr. Douglas, in California, whence its roots were sent to the Horticultural Society, in 1833. It proves a hardy perennial plant, of but little beauty, with very much of the aspect of some white flowered allium. It seems to grow freely in any sort of soil, and will probably thrive, if left to its fate, in the open border all winter. Being at present rare, the experiment has not been tried; but the roots have been taken up, and treated as tulips, in order that no risk may be run of losing them.—*Bot. Reg.*

IRIDEÆ.

LIBERTIA FORMOSA, Beautiful Libertia. This species flowered beautifully in Mr. Cunningham's Nursery, at Comely Bank, Edinburgh, in May, having been received from Mr. Low, at Clapton, who raised it from seeds imported from near the southern extremity of the continent of America, by Mr. Anderson. Its root forms a number of crowns, by which it no doubt may be propagated, and it probably will ripen seeds in the greenhouse. The flowers are white.—*Bot. Mag.*

CULTURE OF THE ANEMONE. All the species are shewy flowering plants, well worth the cultivator's care; they thrive best in light loamy soil. Those species which belong to sections *Pulsatilla Proenanthus*, *Anemonospermos*, and *Omalocarpus*, are either increased by dividing the plants at their roots, or by seeds; and those belonging to section *Anemonanthea* are either increased by off-sets from the roots or by seeds. Under this section is the well known A. coronaria, the varieties of which are very common and graceful ornaments in our gardens. It is valued for its hardy nature, and because it will flower at almost any season, according to the time the roots are kept out of the ground, and the season when they are replanted. Many new varieties have been raised from seed, but they are not named by florists; as in the case of tulips and pinks. The prevailing colours are red, white, and blue; and semi double flowers are in nearly as much repute as double ones. A root which remained in the ground two or three years will attain a great breadth. They are increased by dividing the roots.

The soil preferred by this Anemone, is a fresh loam, rather heavy than light. The usual time of planting is in October, covering the roots three inches; but, to have earlier bloom, they may be planted in the beginning of September; and

to have bloom every month in the year, plant every month. The finer sorts require protection from violent storms, and excessive light and heat; but many varieties thrive exceedingly well in borders. A very severe winter will destroy the roots, if the surface is not mulched, but the Anemone is considerably harder than the garden Ranunculus.

In order to obtain new varieties, seeds should be saved from single or semi-double kinds; to be sown in shallow pots, or boxes, filled with light rich earth, in August, covering them a quarter of an inch thick with the same kind of earth and when the plants rise, care should be taken to protect them from the frost. In the following season, when their leaves begin to decay, they should be taken up and dried, and afterwards planted out in borders, in the same manner as the old roots; and in the following summer they will produce flowers.

Those species under section *Pulsatilloid'es* are greenhouse evergreen herbaceous plants, and grow best in an equal mixture of sand, loam, and peat, but care must be taken not to let them have too much water, when in a dormant state. They often produce perfect seeds, by which young plants are readily raised; they will also strike root from cuttings, in the same kind of soil, under a hand-glass.—*Don's Miller's Dictionary.*

Bombax or Silk Cotton Tree.—The B. ceiba, is a very large tree, the wood is very light, and not much valued, except for making canoes. Their trunks are so large, that being hollowed they make very large ones. In Columbus's first voyage, it was related, that a canoe was seen at the Island of Cuba, made of one of these trees, which was ninety-five palms long, of a proportionate width, and capable of containing one hundred and fifty men. Some writers have affirmed, that there are trees of the silk cotton, growing in the West Indies, so large as not to be fathomed by sixteen men, and so tall that an arrow cannot be shot to their tops. The canoes now made in the West Indies from this tree frequently carry from fifteen to twenty hogsheads of sugar, weighing from six to twelve hundred weight each, the average being about twenty-five tons burden. When sawn into boards, and well saturated with lime-water, the wood bears exposure to the weather many years; it is also formed into laths for roofs, curing pots, and hogshead heading. When the tree decays, it becomes a nest for the Macaca beetle, the caterpillar of which, when gutted and fried, is esteemed by many persons as one of the greatest delicacies. The down which is inclosed in the seed vessels is very soft and silky; it is seldom used, except by the poorer inhabitants to stuff pillows or chairs; and it is generally thought unwholesome to lie upon.

The species of Bombax grow best in rich loamy soil. Cuttings should not be too ripe, and if they are taken off at a joint, they will root freely in sand under a bell-glass, in a moist heat, but plants raised from seeds, brought from the places of their natural growth, make finer trees. None of the species have ever flowered in our stoves, and it is not likely they ever will, as most of them acquire a height of fifty or sixty feet before they attempt to flower in their native countries.—*Ibid.*

Culture of the Hibiscus.—The species are all showy flowering plants. The shrubby stove kinds thrive best in a mixture of loam and peat. Cuttings will strike root readily in sand or mould under a bell or hand-glass, in heat. The greenhouse shrubby species require nearly the same treatment as the stove kinds. The annual stove species should be sown in pots and placed in a hotbed frame,

and when the plants are of a sufficient size, they should be separated and planted singly in pots, in a mixture of loam and peat; and after they have recovered this shifting they should be removed to the stove, where they may remain until they have ripened their seed. The H. Syriacus or Althæa frutex, is the only hardy shrubby species. It will thrive well in any common garden soil, and may be raised in abundance from either seeds or layers. The different varieties of this plant may be grafted on each other, and cuttings planted under a hand-glass will strike root freely. The hardy herbaceous species, which are very showy, thrive best in a moist soil, but being rather tender, most of them require protection in severe winters; they are only increased by dividing the plants at the root in spring.—*Ibid.*

Culture of Stock Gilliflowers.—The method to procure fine double Stock Gilliflowers, Brompton and Queen Stocks, is to make choice of such single flowering plants as grow near many double ones, for it has been observed, that seed saved from plants growing among double kinds, have produced a much greater number of double flowering plants than those which have been saved from plants separated from the double ones. Sow the seed in May, and after they have reached two or three inches high, they should be thinned, at least nine inches asunder, and the plants so taken out, may be planted at about six inches apart in the flower border. If the following winter should be severe, the plants should be sheltered by mats, and in the following May and June they will become the greatest ornament to the flower border.

Fine double varieties may be propagated by cuttings, which take root readily, if planted under a hand-glass and shaded. The Annual or Ten-week-Stock should be sown at three or four different times, February, March, April and May; the plants from the last sowing will continue to flower till Christmas. Care should be taken in preserving only such single flowering plants for seed, both of the Stock-Gilliflower and Ten-Week-Stock, as have flowers of a fine colour. All the biennial and hardy shrub species of Mathiola should be treated in the same manner as that recommended for the Stock-Gilliflower, and all annual species in the manner recommended for Ten-Week-Stocks. Fine double stocks may be planted in pots, in order that they may be sheltered by a frame during winter. M. fenestralis thrives best, if sown on rock-work. The greenhouse shrubby kinds thrive best in a light soil, mixed with sand, and cuttings will strike readily, if planted under a bell-glass.—*Ibid.*

Culture of Wall-Flowers. (Cheiranthus.) The hardy shrubby species, such as fine varieties of the common Wall-flower, should be increased by young cuttings; which will soon strike, if planted under a hand-glass. The greenhouse or frame kinds will thrive in a very light rich soil; and young cuttings, planted in the same kind of soil, will strike most freely under a hand-glass. The perennial or herbaceous species may be increased by dividing the plants at the root, by young cuttings planted under a hand-glass, or by seeds. The biennial and annual species, only require to be sown in the open border; some of the tenderer sorts, or those natives of warmer climates, may be sown in a gentle hotbed, in the month of March, and transplanted in the open borders about the middle or end of April. The whole of the species answer well to be planted or sown on rock-work, and even the tenderer species will survive the winter in such a situation.—*Ibid.*

NATURAL HISTORY.

The White Peach is one of those curious variations from the natural state of a species, the origin of which is as little known as the cause that may have produced it. It is now well known, that whiteness in vegetation is very different from absence of colour: and that while the latter is caused by the total want of the colouring-matter, or chromule of plants, the former is caused by the chromule being of some exceedingly pale tint: for as M. De Candolle has justly remarked, if an apparently white flower be placed before a perfectly white sheet of paper it will always be found to exhibit some tint of yellow, or pink, or blue, or green, &c.

Cause of Colouring in Plants.—There is, perhaps, no subject of more interest than the cause of colouring in plants: it is one upon which till lately no very definite notions were possessed; but it has at length attracted the attention of the skilful vegetable-chemists of Geneva, and the phenomena relating to it are daily becoming more and more intelligible. It appears, that the opinion long since expressed by Lamarck, that when leaves and fruits acquire their autumnal colouring, they are in a morbid condition, and that flowers are, from their birth, in a state analagous to that of leaves in decay, is very near the truth. Taking the green colour so prevalent, and so frequently exclusive in vegetation, as the fundamental colour of plants, it appears that deviations from it are chiefly caused by their chromule being combined with oxygen in different degrees. When leaves are green, they absorb oxygen at night, and part with it by day: but just before they change their colour they cease to part with this gas, continuing however, to absorb it at night. Hence it has been inferred by Mr. Macaire, that oxygenation takes place, which in the first instance discharges the blue and and leaves the yellow, and next produces red; for in all cases red is preceded by yellow in leaves which change their hue. It is supposed that other colours may be caused by alkaline matter, or peculiar vegetable acids, being present, and that in what are called white flowers, the chromule is only in an imperfect condition; as apparent evidences of which, De Condolle points out, 1, the analogy of the colour with that of blanched plants; 2, the much greater proportion of white flowers in northern than in equatorial countries: and 3rdly, the well known fact that many flowers which are at first white become coloured afterwards.—*Bot. Reg.* 1586.

PART III.

MISCELLANEOUS INTELLIGENCE.

I.—QUERIES AND ANSWERS.

ERRATA in vol. iii. No. 31, page 1, line 12, for "Forcing plants," read *Flowering plants.* Page 40, line 4, for "Raminiculaceæ," read *Ranunculaceæ*. Page 42, line 5 from the bottom, for "green fleshed Keiseng, &c." read *Green Fleshed, Keiseng, &c.* Page 43, line 20, for "Criosomra," read *Eriosoma.*

Heat in Vegetable Fermentation. How is it that in the process of vegetable fermentation so great a quantity of heat is rendered sensible, besides the

immense portion that is rendered latent by the conversion of so large a part of the fermenting substance into the gaseous products of fermentation?

I should not have sent you the above, had it not been for the very useful papers which have lately appeared in your pages, on Horticultural Chemistry.

Gosport, December 16, 1833. J. B.

RABBITS AND HARES.—If "J. F." reside within a convenient distance of furze, gorze, or ling; and will bind a few of their bushes round the stems of his young trees, I think he will find the remedy effectual, in preserving them from the attacks of the animals he names. We reside in an open country, celebrated for sporting,—on the verge of a common, where furze grows largely; and our young apple trees, I know, have been thus protected, and are uninjured. If the above plants should not be attainable, perhaps a defence of simple black thorn bushes, fastened to the lower part of the stems, would answer the purpose. I. J. T.

INDIAN CORN.—Mr. Saul's American Correspondent is much mistaken, in supposing (see page 30, in the last number) that the favourite dish across the Atlantic is not attainable in England. The green ears of the hardy short growing species of Maize, which has been so successfully cultivated in this country of late years, form a most delicious vegetable, for about six weeks of the summer season, on which my family regale, preferring it to every other that can be brought to table. The cobs should be plucked just as the styles, that elegant silky looking appendage to the plant, are beginning to turn brown, and wither. The corn is then of a delicate cream colour, and nearly of the same consistence. These cobs are stripped of their covering, and boiled for about three quarters of an hour.

They are eaten with cold butter, pepper, and salt, are held in the fingers,—for greater convenience, by a small portion of the stalk which is left on for that purpose, when the grains easily detach from their indigestible receptacle. I. J. T.

VARIOUS QUERIES.—What is the best and cheapest mode of procuring a quantity of manure for a gravelly soil? Is Tanner's Bark, a lasting or useless manure? Will it do salted, and if so, how much to a three horse load? Would Rubbish-like-Straw be of any use, also salted? I allude to salt, because sea-weed here, and of all other sea-side places is the stable manure. What are Crow-foots of Iron, which were planted to prevent nocturnal incursions into a turnip field, mentioned at Vol. I. page 500, of the *Horticultural Register?* At the same page, Mr. Haythorn says, "I took a pint of strong tobacco water, &c. &c." I wish to know what is strong tobacco water, *i e,* the quantity of tobacco, to the quantity of water—otherwise we are at a loss. S. C.

PLANTS THAT WILL GROW UNDER TREES.—Will you inform a graveller, in answer to part of his inquiry, at vol. 1, page 517, whether the Butcher's Broom (Ruscus aculeatus the Perriwinkle; Penca Mayir aud Menor) and some of the Fern tribe do not grow exceedingly well under trees? These are all very ornamental, and except the Fern, evergreen. S. C.

WOODLICE.—These nuisances multiply with inconceivable rapidity, and when they become numerous in a stove, they take possession of every pot, by entering the hole at its bottom, and forming a nidus for their progeny. They render the soil dry and powdery, and seem to prevent it from retaining a due supply of water. They swarm in a leaf or bark bed, and if a pot be lifted, they may be seen in troops of ten to an hundred, of all sizes. Do they do any real injury to the roots of plants, and can any experienced gardener point out a general reme-

dy, or even a safe application whereby they may be expelled from pots? Repotting in fresh soil is not always desirable, and liquid applications tried at hap hazard, may prove worse than the nuisances complained off. ELECTRICUS.

KENNEDIA RUBICUNDA.—A Correspondent signed Nanto, Vol. II, page 473, makes inquiries respecting the treatment of the Kennedia rubicunda, and in answer, I say that if seeds or cuttings are raised in a hotbed, and potted off in small thumb pots, in a mixture of sandy peat and loam, and when a year old or more, turned out against a trellis in a sunny aspect in a conservatory or green-house, watering moderately when necessary, will succeed, I have no doubt, to Nanto's satisfaction. The reason of his plant not succeeding, is undoubtingly owing to its being kept in the stove, and the green moss growing on the surface of the soil is probably occasioned by over watering. It also flowers beautifully turned out in May against a harbour or a basket handle, inside of which if planted in the middle with Vieussieuxia glaucopsis, and the edges with Streptocarpus rexii looks very handsome. The above mode will greatly invigorate the Kennedia rubicunda. Nanto in page 474, wishes for a little information respecting the Thunbergia alata. Seeds may be sown in light rich loam, and placed in a hotbed, and after they appear in second leaf, pot them in small pots in the above soil, still keeping them in the frame, and potting them as often as they require it; cuttings may be taken from an old plant after it has done flowering, if put in a hotbed to start a few of the eyes, and when struck, treat them as recommended for seedlings, but this should not be done till spring, unless fearful of losing the old one. This sort of plants is very impatient of either wet, cold, or drought, the runners while the plant is in flower may also be taken off and struck as above. Young ones will flower much more freer than old plants. If Nanto wishes any more queries answered, I will, with great reply do it, as far as my humble abilities will allow. F. F. ASHFORD.

November 11, 1833.

☞ The review of "Hortus Woburnensis," which we had prepared for publication, is unavoidably omitted this month.

††† Nematus Capreæ is the name of the insect to which allusion is made in the note at page 61. It was omitted at its proper place, the manuscript being defective.

II.—OBITUARY.

FROM A CORRESPONDENT.—November 14th, died at his house, at Brentford, Mr. Hugh Ronalds, aged 74. Mr. Ronalds and his father, had, for the greatest part of a century, been amongst the most distinguished, as well as the oldest and most extensive Nurserymen in the neighbourhood of London, and had by great diligence and skill acquired a very large and fine collection of plants in every department, of the choicest fruit and forest trees, as well as of the most ornamental plants.

Mr. Hugh Ronalds, whose death we are now sorry to have to record, had a very extensive knowledge of the different branches of science connected with Horticulture; to which he added an acute and accurate judgment, with great skill and extensive practical knowledge of that art; and he was no less distinguished by the uprightness and probity of his dealings. His superb work on apples, gives the best account of the most useful varieties of the most valuable fruit which our climate produces, and, illustrated as it is by such admirable figures, will long continue amongst the standard works on Horticulture. In all the various relations of private life, his conduct was truely kind and exemplary. This imperfect tribute to his merit proceeds from a friend, who, for fifty years has known his worth. J. T.

III.—OBSERVATIONS ON NATURE.

The Common St. John's Wort, (Hypericum perforatum,) has a powerful lemon-like scent when rubbed, staining the fingers with dark purple, from the great abundance of coloured essential oil, lodged in the herbage, and even in the petals. As this plant was found to bleed at the slightest touch, it was supposed to have a healing quality, and that it became the "balm of the Warrior's wound," giving a blood-red colour to every composition, whether of a spirituous or oily nature, into which it entered. The common people in France and Germany gather this species with great ceremony, on St. John's Day, and hang it in their windows as a charm against storms, thunder, and evil spirits, mistaking the meaning of some medical writers, who have fancyfully given this plant the name of *Fuga Dæmonum*, from a supposition that it was good in maniacal and hypocondriacal disorders. Formerly it was always carried about by the people of Scotland as a charm against witchcraft and enchantment.

The Butter and Tallow-Tree, (Pentadesma butyracea.)—The yellow greasy juice from which this tree derives its vernacular name, is given out copiously when the fruit is cut or opened; it is mixed by the natives of Sierra Leone with their food, but it is not used by the settlers, on account of a strong turpentine flavour which belongs to it. We believe that the juice is that of which the country butter, brought to the market of Freetown, is made.

The Sugar Maple.—From this tree the inhabitants of North America make a very good sort of sugar, in large quantities. The juice is obtained by tapping the trees: warm days and frosty nights are most favourable to the plentiful discharge of the sap. A hole is made in the tree, in an ascending direction, by an augur, and a spout is introduced about half an inch, which projects from three to twelve inches: it is generally of sumach or elder. The sap will sometimes flow six weeks, according to the temperature of the weather. Troughs are placed under the spouts to receive the sap, which is carried every day to a large receiver, from which is conveyed, after being strained, to the boiler. Lime, eggs, or new milk is added to the sap in order to clarify it, but clear sugar may be made without any of these ingredients. The sugar after being sufficiently boiled, is grained, clayed, and refined in the same manner as the cane sugar in the West Indies. The sooner the sap is boiled, the better. It should never be kept more than twenty-four hours. The quality of maple sugar is superior to that which is made from canes in the West Indies, and it deposits less sediment when dissolved in water. It has more the appearance of sugar-candy.

The Common Soap Berry, (Sapindus saponaria.)—The nuts of this tree were formerly brought to England for buttons to waistcoats; some were tipped with gold, and others with different metals; they were very durable, as they did not wear, and seldom broke. The skin and pulp which surround the nuts, are used in America to wash linen, but it is very apt to burn and destroy it, if often used, being of a very acrid nature. The seed vessels, according to P. Browne, are very detersive and acrid; they lather freely in water, and will cleanse more linen than sixty times their weight of soap, but they are observed to corrode, or burn the linen in time, and the water in which the tops or leaves have been steeped or boiled, has the same quality in some degree. The seeds are round and hard, have a fine polish, and are frequently made into buttons and beads by the Spaniards. The whole plant, especially the seed-vessels, being pounded and steeped in ponds, rivulets, or creeks, intoxicates and kills fish.

Specific Gravity of Hot and Cold Water.—If a quantity of cold water be poured into a vessel, a thermometer being immersed in it, and a quantity of hot water be poured carefully over it, so as to prevent the fluids mixing by the agitation, it will be found that the hot water will float in the cold, the thermometer immersed in the cold water will not rise; nor will a thermometer immersed in the hot water poured over it fall. But if, by introducing a spoon into the vessel, and agitating the water, a mixture of the hot and cold be produced, the lower thermometer will immediately rise and the upper fall, and both will ultimately stand at the same temperature, intermediately between their former indications. If, on the contrary, hot water be first poured into a vessel, a thermometer being immersed in it, and then cold water be carefully poured upon the hot, so as to prevent such agitation as would cause the fluids to mix and a thermometer be also immersed in it, it will be immediately found that the lower temperature will fall, and the higher one will rise. In fact, the cold water descends through the hot by its superior gravity; but in this case the fluids, in passing through one another, become mixed, and the whole mass will take an intermediate temperature.—*Lardn. Cyclop. Hydrostat.*

Process of Water Boiling.—The process by which water is boiled in a vessel, affords an example of the effects of a liquid expanding by heat. When fire is applied at the bottom of a kettle containing water, the stratum of water immediately in contact with the bottom, becoming heated, expands, and is consequently lighter, bulk for bulk, than the water above it. By the general principles of hydrostatics it ascends, and the colder liquid, descending takes its place. This becoming heated, in its turn likewise ascends; and in this manner constant currents upwards and downwards are continued, so long as the fire continues to act on the bottom of the vessel. Thus every particle of the water in the vessel, in its turn, comes into contact with the bottom, and receives heat from it; and by the continuance of this process the temperature of the water is raised until it boils.—*Ibid.*

Cause of Dew.—The discovery of Dufay remained a barren fact, until the attention of Dr. Wells was directed to the subject. He argued, that, as a clear and cloudless sky radiates little or no heat towards the surface of the earth, all objects placed on the surface, which are good radiators, must necessarily fall in temperature during the night, if they be in a situation in which they are not exposed to the radiation of other objects in their neighbourhood. Grass and other products of vegetation, are in genaral good radiators of heat. The vegetation which covers the ground in an open champaign country on a clear night, will, therefore, undergo a depression of temperature, because it will absorb less heat than it radiates.

The vegetables which thus acquire a lower temperature than the atmosphere, reduce the air immediately contiguous to them to a temperature below saturation, and a proportionately copious condensation of vapour takes place, and a deposition of dew is formed on the leaves and flowers of all vegetables. In fact every object, in proportion as it is a good radiator receives a deposition of moisture. On the other hand, objects which are bad radiators are observed to be free from dew. Blades of grass sustain large pellucid dew drops, while the naked soil in their neighbourhood is free from them.—*Ibid.*

Physical Constitution of the Moon.—The moon has no clouds, nor any other indication of an atmosphere. Were there any, it could not fail to be per-

ceived in the occultations of stars, and the phenomena of solar eclipses. Hence its climate must be very extraordinary; the alternation being that of unmitigated and burning sunshine, fiercer than an equatorial moon, continued for a whole fortnight, and the keenest severity of frost, far exceeding that of our polar winters, for an equal time. Such a disposition of things must produce a constant transfer of whatever moisture may exist on its surface, from the point beneath the sun to that opposite, by distillation *in vacuo*, after the manner of the little instrument called a *cryophorus*. The consequence must be absolute aridity below the vertical sun, constant accretion of hoar frost in the opposite region, and perhaps a narrow zone of running water, at the borders of the enlightened hemisphere. It is possible, then, that evaporation on the one hand, and condensation on the other, may, to a certain extent, preserve an equilibrium of temperature, and mitigate the extreme severity of both climates.—*Herschel on Astron.* —*Lard. Cyclop.*

Sun's Rays.—The sun's rays are the ultimate source of almost every motion which takes place on the surface of the earth. By its heat are produced all winds, and those disturbances in the electric equilibrium of the atmosphere which give rise to the phenomena of terrestrial magnetism. By their vivifying action, vegetables are elaborated from inorganic matter, and become, in their turn, the support of animals and men, and the sources of those great deposits of dynamical efficiency which are laid up for human use in our coal strata. By them the waters of the sea are made to circulate in vapour through the air, and irrigate the land, producing springs and rivers. By them are produced all disturbances of the chemical equilibrium of the elements of nature, which by a series of compositions and decompositions, give rise to new products, and originate a transfer of materials. Even the slow degradation of the solid constituents of the surface, in which its chief geological changes consist, and their diffusion among the waters of the ocean, are entirely new to the abrasion of the wind and rain, and the alternate action of the seasons; and when we consider the immense transfer of matter so produced, the increase of pressure over large spaces in the bed of the ocean, and diminution over corresponding portions of the land, we are not at a loss to perceive how the elastic power of subterraneous fires, thus repressed on the one hand and relieved on the other, may break forth in points when the resistance is barely adequate to their retention, and thus bring the phenomena of even volcanic activity under the general law of solar influence.—*Ibid.*

The Starling.—Much confusion appears to have existed respecting the common starling: whether such a bird as the solitary thrush exists in this country, I cannot pretend to say; but it is certain, that the common stare does not obtain its black plumage until the end of July or beginning of August, being of a dingy hair-brown colour. This plumage is sometimes very smooth, and gives the bird the appearance of an adult, but it only remains until the first autumn, when the black feathers appear first on the sides, and gradually spread over the whole body. The plumage, however, is not in perfection until the second moult.—*Field Nat. Mag.*

IV.—MONTHLY HORTICULTURAL CALENDAR,

FOR FEBRUARY.

THIS winter has been remarkable for its mildness, and also for the violent winds and amazing quantity of rain. Should February continue open and not be excessively wet, we would recommend that towards the end, advantage be taken of every fine day to get in some of the principal crops.

Peas and Beans.—About the middle or end, sow in drills, also in boxes, Early Frame peas, and the Mazagon and Lisbon beans are the best. See Vol. 2, page 95. To prevent mice from destroying them, use Mr. Howden's trap, Vol. 1, page 796, or place the prickly branches of furze in the drills, with the seed. If slugs infest them as soon as they appear, destroy them with lime, as recommended Vol. 2, page 533.

Broccoli.—Sow a little impregnated Early White about the middle, to produce from October to Christmas. Preserve them from slugs and snails as above.

Potatoes.—About the middle plant the Early Manly and Early Kidney close under a south wall, or under the wall of a hothouse, and mix a deal of sand in the soil, to come into eating the end of May.

Celery.—In the beginning sow on a slight hotbed or in frames, and scatter a little cauliflower seeds over the bed to succeed those under hand-glasses.

Radishes and Lettuce.—Sow the first and third weeks in light soil, in a warm situation; birds and slugs are very destructive in general, if not netted over, scatter a good coat of quick lime as soon as the plants begin to appear.

Carrots.—In the beginning sow Early Horn and Early Short Red Horn, on a slight hotbed; and about the end, a few of the same on a warm border to succeed them.

Spinach.—Towards the middle sow Flanders and Round-seeded, and preserve them from the depredations of sparrows.

Onions.—About the end, sow the main crop, in beds four feet and a half wide, and trample them well down, if the land be light.

Pot-herbs—Sow about the end.

Rhubarb.—Plant two years old roots in heat, for forcing.

Kidney Beans.—Sow the cream coloured and early Buff in small pots for forcing, as recommended in Vol. 2, page 96.

Asparagus may still be taken up and planted on a slight hotbed for forcing.

Parsnips—At the end, sow Guernsey and Hollow Crowned.

Shallots and Garlic.—Plant towards the end. See Vol. 2, page 96.

Cabbages.—Plant autumn sown ones, for use in July, and sow seed to produce greens in August.

FLOWER DEPARTMENT.

Annuals (tender.) Sow in small pots, and plunge in a good heat. See Vol. 2, page 112.

Auriculas.—About the middle, top-dress with a mixture of one half well rotted turfy loam, one fourth vegetable mould, and one fourth well rotted dung, either of cows or horses, a portion of river sand, and a little fine bonedust. Also water once or twice a week with liquid manure.

Dahlia Seed.—Sow in pots about the middle, and place them in a hotbed frame; also about the end, plunge the old roots in a little tan, to forward their growth.

Polyanthuses.—Top-dress as recommended for Auriculas. The soil however need not be so rich.

Ranunculuses.—Plant in beds about the end.

Roses in Pots.—Now placed in the forcing-houses, produce flowers, the middle of April. If they are infested with aphis, fumigate with tobacco, or sprinkle with tobacco water.

FRUIT DEPARTMENT.

Vines in Pots, now introduced into the Vinery, ripen fruit in June. Those set last month will require thinning, and the young branches tying in. See Vol. 2, page 96.

Cherry Houses must have air night and day, and keep sufficient fire to give a temperature of forty degrees Fahr. See Vol. 2, page 96.

Strawberries in Pots.—Bring into the forcing house once a fortnight; give them a plentiful supply of water.

Peach and Nectarine Trees.—On the open wall should not be pruned till the buds have a little advanced. Those in forcing houses, if in flower, or setting their fruit, should have plenty of air early every morning, and be shut up close early in the afternoon, and be occasionally moistened by steaming.

Pruning and Nailing must be forwarded with all speed.

Raspberries.—Make new plantations, as recommended in Vol. 2, page 90.

Graft Fruit Trees early in the month.

THOMAS HARDCASTLE, PRINTER, CHURCH-STREET, SHEFFIELD

THE

HORTICULTURAL REGISTER,

MARCH 1ST, 1834.

PART I.

ORIGINAL COMMUNICATIONS.

HORTICULTURE.

ARTICLE I.—ON THE CULTIVATION OF VINES IN POTS.

By the Author of the Domestic Gardeners' Manual.

THEY who possess the connected series of the *Horticultural Register,* and have attentively perused its pages, must be fully aware of the several instructive articles that have been written upon the subject to which I again solicit the attention of your readers. Mr. Stafford led the way in your first number, and he was ably seconded. He added fact to fact; but still, some doubted. Mr. Mearns, of Welbeck, however, in his excellent and illustrative paper, Article III, of the 23rd number, performed the crowning act, and proved at least one of two things; either that vines *can* be grown, and grapes of the highest quality produced,—abundantly so—by pot culture, or that there is no faith, no confidence to be placed in man.

I have, upon a former occasion, endeavoured to show cause for a steady perseverance in a course of experiments. I am, myself pursuing that which I recommended to others; but as I have not as yet attained sufficient experience to qualify me for stating decisive results, I shall not swell this paper by entering upon any further details of practice. My present object in fact is not so much to write upon the culture of the grape, as to solicit your readers' attention to a curious circumstance, which has surprised and interested me not a little. Every one must be aware of the queries of your correspon-

dent "Vigorniensis," and of the doubts of a successful result which that writer very recently expressed. By referring to page 532, of the closing number of the second Volume, the reader will find the following sentences,—"He (Vigorniensis) much fears, notwithstanding the undoubted success of Mr. Stafford and others, that the system will not prosper to the extent anticipated. Mr. Grey informs us that he has tried it for years, and, as it should seem, with care and judgment, but he has failed." He then proceeds to state three causes of doubt.

Mr. Grey, it should seem, is the authority to whom Vigorniensis is most ready to refer: he had met with indifferent success himself, as expressed in No. 19, of "*Queries and Answers*," Vol. 2, page 377, and therefore, he leans to the suggestion of the one who doubts, in preference to the assurances of a host of others who have confidently declared their full, their entire success. This however, is natural, and I am not in the least surprised at it; but I confess that I am not only surprised, but astonished, at the circumstance which I now proceed to relate.

Having, within the last few days, been favoured with a sight of Mr. Harrison's *Gardeners' and Foresters' Record;* upon turning over a few of the pages of that work, in the first instance, I caught a glimpse of your correspondent's assumed title. My attention was arrested to the subject, which is ever one of great interest to me. It bore date September 4th, 1833, and was the leading article of No. 5, "On the Culture of Vines in Pots, by Vigorniensis." Expecting to find a detail of facts agreeing in character with those stated by that writer in the *Horticultural Register*, judge of my surprise, when I perused the paper which, for the real benefit and indeed pleasure of those who do not see the work referred to, I must copy verbatim. I hope that the evidence thus afforded, the additional proof therein given, of the feasibility of the method of pot-culture, will plead my excuse for thus trespassing upon your pages, and upon the attention of their readers.

"The cultivation of vines in pots is a department in the art of gardening with which I am very highly pleased, and in the treatment I have practised, the success has not only been ample, but most abundant; and I find it of very great advantage in serving the table with grapes for the dessert, for a very great length of time, by taking in a few pots at once. The following remarks include my method of culture."

"The vines I possess were raised by myself from single eyes. I selected plump buds from short jointed, well ripened shoots; these I

struck in the heat of a cucumber hotbed, in February, 1828. When they had pushed a joint each, I had them potted off singly into pots of about six inches diameter. The soil I used was a fresh turfy loam that had been paired off two years before, about three inches in thickness, and had been laid in a heap. With the loam, I mixed about one-third of well rotted dung. In these pots, the vines grew amazingly; in two months they had reached eight or ten feet high, and the shoots were more than half an inch in diameter. At the end of this time I repotted the plants, using the same kind of soil, and pots about ten inches in diameter. I put an inch deep of broken pieces of pot into each, and potted the vines with balls entire. I then shortened the shoots by cutting them back to about three feet, at which place I had suffered a lateral to remain; this I did in order to strengthen the vines. A leading shoot pushed from each very vigorously, but I kept stopping them every time they had reached one foot from the last stopping. At all times I freely supplied them with water and liquid manure occasionally. The plants were kept in the vinery all the season. I placed them on the front flue upon a trellis, and under the centre of each sash, so that all possible light was afforded them."

"At the end of October, I turned the plants into the open air, placing them under a south wall. At the same time I pruned the vines, cutting them down to just below the place where the lowest lateral had been allowed to grow for a leading shoot, at the first stopping in summer. When the vines were a little hardened, which was the case by the beginning of December, I took them into a vinery in which no fire was kept during winter, here they were protected from wet and very severe frosts; thus none of the buds suffered from the alternates of wet and dry, which sometimes is the case with vines wholly exposed."

"When I determined to force some of the vines, I then repotted them with entire balls, into pots thirteen or fourteen inches in diameter, using the same kind of compost as before. The roots being coiled round the ball and matted, I shook it forcibly against the ground which loosened the ends of the fibrous roots without damaging them. This attention to the roots enables them, when the plants are repotted, immediately to strike into the soil. I do not introduce the vines I am about forcing into a brisk heat at once, but do it gradually."

"From vines treated as above, I do not fail to have, the second season, less than ten bunches of fruit. When the bunches are shewn, I stop the lead, and never allow it to push long afterwards before it

is again stopped. At the end of the summer, or before, if the wood is perfected, I turn out the plants, and otherwise treat them as done last year. When I pruned them in autumn I cut each lateral shoot back, so as only to retain two eyes on each."

"The plants have not been repotted since the spring of 1829, and each year produce me at least twenty bunches of fruit. I take in about six plants at each time."

"The kinds of vines I thus cultivate are, Black Hambro,' Black Cluster,' White Cluster, Black Anstantea, White Sweetwater, the Grisley and White Frontignac, and White Muscadine. All these kinds are very prolific, and of good flavour." VIGORNIENSIS.

Sept. 4th, 1833.

Here then, worthy reader, you have a fair and full recital of a mode of successfully cultivating the vine in pots; and with one or two ambiguities, which, not to be hypercritical, I shall pass over; the description is sufficiently luminous and explanatory: but are we in the land of enchantment, or among the actors in the "comedy of errors," the antipholi and the dromios? "Can such things be,

"Or have we eaten of the insane root,
"That takes the reason prisoner?"

Is it possible that, the "Vigorniensis," of Worcester, the doubting, disappointed cultivator of the *Horticultural Register*, should be identical with the confident, the successful "Vigorniensis" of the *Gardeners' Record!* Can we for a moment admit the belief that, the Querist of Vol. 2, page 281, who felt the embarrassment which he detailed in the paragraphs 6 and 8 of that page, is one and the same with the writer who, scarcely five months afterwards could, from the experience of so many years, boldly, unhesitatingly assert that, his plants had, without one single failure, produced, each, fully, "twenty bunches of fruit?" Above all, can we deem it possible, in the very nature of things—without indeed proving *truth* to be a *liar*—can we conceive that, this assured cultivator of fine fruit, who states his success, under date Sept. 4th, 1833, could again turn back to doubt and hesitation; and in his notice of thanks to me, dated Oct. 4th, 1833, state it to be his conviction that, "the system will not prosper to the extent anticipated?" See Vol. 2, page 532.

What! will not the extended, never-failing experience of five years, satisfy his scruples? Can *he* doubt of success who has eaten of the fruit of his vineyard for one entire *Lustrum?* What a monstrous thing is unbelief.

When I first read the welcome paper signed by my friend "Vigorniensis" in the *Record*, I could not but hail it; "is Saul also

among the prophets?" said I to myself! But no, it cannot be; that sad epistle of Oct. 4th, forces on me the conviction that there was nothing in a name, and that "Vigorniensis" of Worcester was, and is still, the man of doubt, unknowing and unknown to him of the *Record*, whose deeds recorded, do well entitle him to the name he assumes!

There is no evil, however, without its attendant good: that, wherein I have lost my hopes, has furnished another proof to my correspondent whereupon to ground his confidence of final success. For his further comfort, I may add, that Mr. Knight, of Downton Castle, assures me, that vines will do perfectly well in pots, provided they have room, and are supplied with manure water.

I trust then, that "Vigorniensis," of Worcester, will persist in his laudable exertions, and that they will be crowned with success to his heart's content. May the day be not far distant when his name shall rank with the Knights, the Staffords, the Smiths, *cum multis aliis*, and last though not least, with the Mearns! In the meantime, may his table be daily furnished with the delicious fruits from his own vineyard in miniature, raised by his own hands; each plant of three or four feet in height bearing ten, twenty, thirty, noble bunches. Finally, may he in the joy of his heart, his doubts removed, his success assured—favour us with a clear and comprehensive detail of his experiments in terms still more triumphant than are those of his energetic namesake. I, for one, will not be backward in offering my congratulations: I will hail his victory over difficulty with

Valde perstiteste vinitor
"Sic itur ad astra."

January 25th, 1834.

ARTICLE II.—MORE ABOUT VINES IN POTS.

BY MR. STAFFORD.

In Vol. 2, page 496, is a valuable paper on the culture of vines in pots, containing eight different plans of pits for their growth, all of which are well adapted for the purpose. At the conclusion of this excellent article, the writer, Mr. Mearns, expresses a wish to have some information respecting Mr. Buck's method of treating his plants.

Having myself resided for five years within a few miles of Mr. Buck, and three of his brothers, all of whom I consider men of first

rate abilities, and by whose means I have had the happiness to learn much; I am, therefore, able to state the usual method followed by Mr. Buck, which is much the same as that dictated by me, in the early part of the first Volume of the *Register*, except that he never attempted to have his crop of fruit, on the vines in pots, ripe until the winter; expressly for the purpose of supplying the table in the spring, after those on the rafter were all cut.

In this respect, Mr. Buck excels to a great degree, and appears to have the art of keeping his supply of fruit until it is wanted, with little difficulty, for no sooner are the fruit come to maturity than he removes the pots in which the plants grow, from one apartment to another of a lower degree of heat, until at last they are placed in the greenhouse, in which place they remain until wanted for table, which is not unfrequently late in the spring.

It always appeared to me, that grapes so treated would keep much longer than those produced under any other method of treatment, because, as the fruit approaches to perfection, water is withheld, and the functions of the plants are suspended. In this state the fruit will remain for months without any perceptible difference, either in size or flavour, for it of course parts with that portion of water which in other methods produces the destruction of the berries.

I have seen the back flues and front curb stones in Mr. Buck's houses filled with pots of bearing vines, at ten or twelve feet distant from the glass roof, loaded with as fine fruit as can possibly be grown. In fact, I feel confident that the oldest and most experienced gardeners would scarcely conceive it possible to bring the system to that degree of perfection, in so limited a space of time; for I do not think the pots made use of are larger than those in which it is usual to fruit pine plants.

These plants are all grown exactly the same as those about which I have previously written, with one shoot; and instead of allowing them to grow to twenty-four or twenty-seven eyes, they are stopped at about fifteen or sixteen, and pruned in the winter to about twelve or fourteen eyes, varying a few eyes according to the strength of the plants.

When the crop is gathered, Mr. Buck prunes his plants on the common spur system, and at the conclusion of the second crop, the plants are thrown away, and others substituted in their stead. Through the medium of a friend and neighbour of Mr. Buck, I was in hopes before this, to have been able to have forwarded a paper on the subject from Mr. Buck's own hand; as, however, this is not the case, I am certain he will excuse the liberty I have ventured to take,

in making public a process which does him so much credit, and I am the more anxious to do so because I believe, that, at no far distant period, vines in pots will be the means of supplying the tables of our nobility and gentry with fruit unrivalled in excellence, every month of the year.

Whoever has paid attention to what Mr. Mearns names, will, I am sure, credit his assertions, when he states that he grows large crops of grapes on the same vine in the same pot, for eight successive years, without the least renewal of earth. This practice, I have observed to answer in many places, but I never could succeed in it to my satisfaction, and therefore adopted the method of heading down the stem and reducing the root. As there is so little difference betwixt the two processes, I shall not here state which I prefer. After a multitude of experiments, which I have been making on very young and small vines in pots, I am brought to the conclusion, that if they be properly treated through the summer, with respect to heat, light, air, and water, and not taken out to *winter* till the wood is perfectly ripe; there may be as many bunches produced as under any other course of treatment that can be adopted. I have also good reason to believe, that this might be accomplished in much smaller pots than I formerly advised to be used; and here I wish strenuously to press this subject on the attention of others, for should we succeed in this respect, the advantages will be very great and numerous.

13

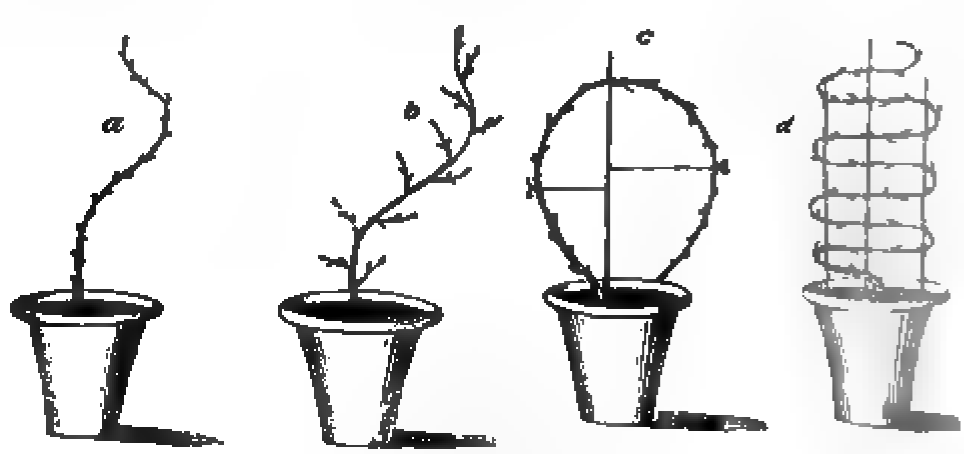


Fig. 13, (*a*) is intended to represent a plant pruned the first year; (*b*) the same plant pruned the second year showing the spurs; (*c*) a pot with the plant curved, until the extreme point is brought down to the pot, the stem being tied with twine; (*d*) a plant coiled round three sticks, which causes the eyes to break stronger than by any other means.

ARTICLE III.

PROPAGATION OF VINES ON THE COILING SYSTEM.

BY MR. J. MEARNS. F. H. S.

Gardener to His Grace the Duke of Portland, Welbeck, Notts.

I AM anxious that the season for procuring plenty of grape vine branches, for coiling into pots, as I recommended in Vol. 2, may not be allowed to pass by. It is a most important thing to be able to put in a *rootless* cutting at this time, and so on till March, or June; and to insure a fine crop of grapes the same season; even to twenty or thirty bunches on one vine in a pot as the sorts may be. Although the shoots which I have yet put into action are taken from very weak vines, I have some with, from ten to twenty bunches upon them; and am not in the least apprehensive but they will all set, and swell off to a fine size, and ripen very superior to those produced by any other method. I do not mean to say that they will ripen better than if upon a previously rooted vine, if well prepared; I only mean so far as the bottom heat is concerned. The greater advantage of the coiled branch, is the extraordinary space of time gained over the single eye system, or the usual cuttings, or even the usual layer.

It may suit the nurseryman, who wishes to obtain as many plants as he can from a single shoot; but that is not what the grape-grower desires: his object is very different; he aims at producing the greatest quantity of fine grapes; and under the most disadvantageous as well as advantageous circumstances, in the least possible time. By my method I shall introduce vines into any farmer's garden in the kingdom, where none had previously been; and at the expense of little besides ten or twelve lights of glass will insure him from 500 to 1000 fine bunches of good grapes the first season! If any one can boast the same, the fact has never been laid before the public, else it is likely I should have seen it. I go thus far, on purpose to raise a curiosity, and to excite every degree of emulation, knowing, that if such can be excited, the system will very soon discover itself to be most important to the country. The successful cultivation of the grape is certainly one of the simplest branches of the art, both in pots and in borders; if a vine be left entirely to itself it will soon become fructiferous; after having been for years under the most rigid discipline to little purpose. A vine excited to a high degree of luxuriance, is neither the most fruitful, nor produces the finest or best grapes. I have seen Hamburghs, from three to six and eight pounds weight each bunch! The vines comparatively *weak* and vine border very shallow; and by no means rich!

As curiosity will be created by such a remark; I beg to state, that such grapes were repeatedly produced by a Mr. Minnett, formerly gardener to Mrs. Powes, Berwick House, near Shrewsbury.

I have there seen bunches of Hamburghs, from fifteen to sixteen inches long, and from eight to ten inches across the shoulders; the berries all of a perfect black, as close as they could grow together, and the size of a boy's *large* marbles.

I have coiled into pots this season upwards of a hundred branches; forty and more of which I have got into action. I shall continue to introduce others till the middle of June; if I can *starve* them into dormancy by cold bleak exposure, or by burying them in clay-cold murkey graves or caves! or by being sunk under a wall on a north aspect. I am begging of all my friends, the long branches which they cut out in pruning; and as far as Somersetshire, Worcestershire, Staffordshire, &c. &c. so that I expect, in a short time, to have a stock of plants sufficient to produce 1000 bunches the first season.

I should not have sent this account to you at this time, had it not been my anxious desire that the public should be in possession of it, ere the season for finishing vine pruning is past. It is certain it soon will be, and then one year's enjoyment is lost; and that I am sure would be a year of vexation to many of your amateur readers. That such may not be the case, I most anxiously beg of you not to lose a month; but, if it can be inserted in no other place of next *Register*, let it be inserted as a postscript.

Welbeck Gardens, Ollerton, January 13*th*, 1834.

ARTICLE IV.

MORE ABOUT THE COILING SYSTEM OF PROPAGATING VINES.

BY MR. MEARNS.

I HOPE to see a Postscript attached to the February Number of the *Register* upon the coiling system of grape vines,* as I should indeed be sorry if your readers were to lose a season so important in the cultivation of that desirable object. Put in your cuttings of young wood, in coils of three, four, to five feet, blinding all the eyes, except the two uppermost. I choose to leave two eyes till the finest gets the lead, and is safe, for fear of accident to one alone; I then slip the weakest off. If placed into a bottom heat, and the eyes be

* It reached us too late for insertion in any part of February Number.

buried about an inch or two in the pots, in the course of coiling, by the time the best eye appears above the soil, as strong as the bud of a fine asparagus! The whole coils beneath will be completely occupied with young active roots; and by the time the shoots are four feet long, the pot will be a perfect mat of those eager feeders. Then shift and top the shoot and never leave on any laterals; plunge as before into a fine bottom heat; and encourage the main topmost eye alone to push; and lead it on, but without laterals, till it is again four feet long; when, if the pot is full of roots, shift, top it as before; and encourage again the uppermost eye only to start; and by the time it is another four feet, if not over-potted before, it will require a third shifting. If required, you may stop at every four feet, five or six times; but three shiftings will be found enough for the season; and you had best not suffer it to reach above from twelve to twenty feet of clear bearing wood. At the end of the season, you will have shoots one inch and a half diameter, and with fine bold eyes, and full of fine set bunches for the next season!

You will readily perceive, that, by such an early and abundant accumulation of young vigorous roots, and by such a top and bottom management, it is no extraordinary miracle to have every cutting a fruit bearing shoot at one season's growth; and by a proportional coil of large older wood, it will be equally obvious to you how readily such will produce a fine crop the first season!

I expect to have the pleasure of a visit from you soon, when I fancy you will be gratified as well as satisfied with its success, and extraordinary simplicity. I think you must be well aware of its great importance to the world; and if ever such a method had been previously adopted, it would have been noticed long ere this; and its importance would have caused it to be generally adopted. As such has not been the case, I think it must be allowed to originate from me.

The extraordinary progress of my grapes upon the coiled vines, placed in a bottom heat, astonishes every one. In another season, when I have got my wood early ripened, I intend to start some in October, and to have plenty of fine ripe grapes by the middle of February. I have some at this time half grown, the branch being only cut from the vine, and placed in bottom heat 20th of November! "Can such things be!" yes, easily and simply so. I intend to keep some coilers as late as the middle or end of July, before they are excited, and then to place them in a bottom heat. The fruit, by doing so, will be perfectly ripe before the dull weather of autumn sets in, but not so with the wood; by which circumstance they

will retain the leaves vigorously through the winter, and consequently the fruit will retain its plumpness till April or May!

You will now say this is going too far, but it undoubtedly may be done. New ripe grapes in February, and plenty of old grapes till the end of June! There is little beyond the power of man, if he will but exert those faculties with which God has endowed him.

It has been stated by a contemporary author, that it is our own fault if we do not make ourselves kings, however low our rank in society. To a certain extent he is right, although at a transient glance, it may appear a wild expression, and a moral impossibility; but such things have been, and still are! I admire those apparently wild rhapsodies; for I am sure, however extravagant they may appear, a young man cannot read them without reflecting on them, and if he does reflect, he cannot help being the better for it. If he has energy in him, all his powers will be aroused into action, while he says to himself "are such things possible, and am I, drone-like, lying a burden, rather than an useful member of society? I feel I have common sense; then let me arouse those inert powers, and if I do not rise to be a king, I will strive to be a man, and fill up that blank in creation for which I was intended, by being an useful member of society.

If we strive to be useful, and to please, and this is all that is exacted of us, we shall add to the comfort of those around us, as well as our own.

Welbeck Gardens, Ollerton, January 29th, 1834.

ARTICLE V.—ON THE PRODUCTION OF WATER.

BY J. B.

I HAVE been induced to trouble you with the following remarks, by the perusal of a paper on Horticultural Chemistry, in your last number. The author states, that he does not consider the union of the two gaseous compounds of water sufficiently accounted for by the evolution of caloric. In a work like your's, which is intended principally for the perusal of practical men, I think it is of great importance that the subjects discussed in its pages should be explained in the most simple and perspicuous manner, and the writers should avoid as much as possible all perplexing theories, and pursue as far as they can the sure and steady course of experimental enquiry. I am inclined to think that the production of water is sufficiently accounted for by the evolution of the latent caloric contained in its

gaseous compounds. If we take a portion of water, and apply heat to it, we see it gradually converted into a vapour, occupying 1680 times the space it occupied in its fluid state. By a still greater application of heat, it can be resolved into its ultimate compounds, hydrogen and oxygen; a fact which is very beautifully shown in the operation of a patent lately obtained by a gentleman of the name of Rutter; where a small stream, of water and coal tar, is allowed to run on any substance in a state of vigorous combustion, and the water is converted into hydrogen and oxygen, and in flames, producing a very intense degree of heat. This has already been applied to a useful purpose in some manufactories, where a strong heat is requisite. Why then, since by the addition of caloric, water is converted into gas, should not its abstraction be equally efficient in converting gas into water. But, then, it may be said, light as well as heat, is made manifest, and whence is the light derived? In answer to this question, all I have to say is, that, in this instance, I consider the light to be occasioned by the sudden evolution of so large a quantity of caloric; for that light does not enter into the composition of gas, as an ingredient, if I may so use the word, is evident from the experiments made by Mr. Faraday on the condensation of different gases by pressure. He states, that a great deal of heat was given out, but does not mention that any light was made manifest, a circumstance which, had it occurred, could not have escaped his observation.

I cannot omit this opportunity of thanking the author of the paper about which I am so unfortunate as to differ, for the melon seeds he was kind enough to forward to you in the spring, and by which I, and many of my friends, have made a great addition to the varieties of that esteemed fruit.

ARTICLE VI.

ON A PECULIAR MODE OF TRAINING FRUIT TREES.

BY MR. JAMES WALDRON,

Gardener at Elm-Grove, Roehampton, Surrey.

THE present plan of Training Fruit-Trees upon walls will, I think, if practised, far exceed most of the other modes at present in use. I think the tree may be kept in a better bearing state, and be always filled with young bearing wood, I also think it superior, for beauty, to fan training.

I have this season begun to work six young pear trees, upon the plan at Elm-Grove, and feel satisfied the system will answer perfectly well.

14

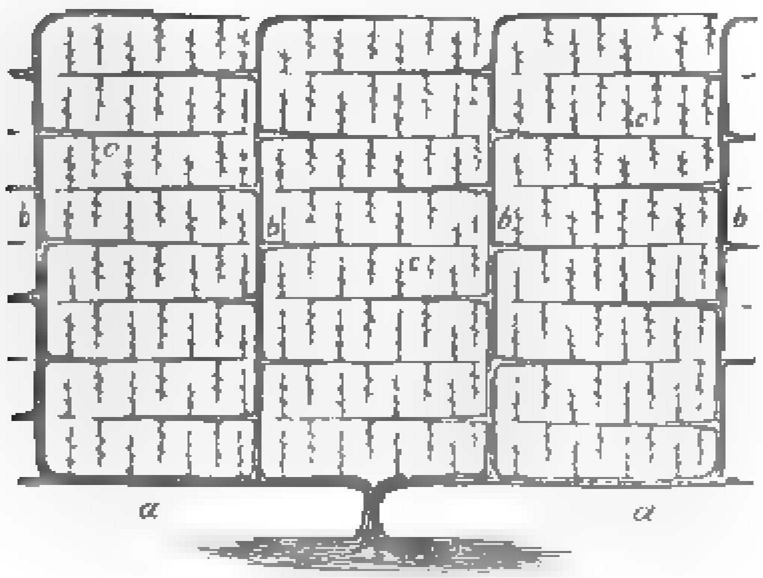


Fig. 14, (*a*) is intended to show the horizontal branches of the tree which are first formed in the training; (*b*) the perpendicular branches springing from the horizontal ones made next; (*c*) a series of horizontal branches to be trained from the perpendicular ones, from whence the young fruit-bearing wood trained perpendicularly upwards and downwards alternately.

ARTICLE VII.

TO HAVE PLENTY OF FINE CAULIFLOWER, CAPE BROCCOLI, AND GRANGE'S CAULIFLOWER-BROCCOLI,

Through the Winter, and till the Spring Broccolies come in.

BY MR. J. MEARNS, F. H. S.

Sow at the end of June, and on to the end of July, and get the plants as strong as you can before the frost sets in. It is better that none of those have the least appearance to flower when taken up for protection. Then lay them into the ground, with the heads to the south, if it can be done conveniently, leaving little beside the thick leafy top out of the ground. Firm the soil to the roots and stems, to keep out mice, &c. cover them in all frosty weather, but expose them at all times when the weather is not severe. By such management they will produce handsome, and compact sized heads through the winter, and as long as required, and even till early cauliflowers come in.

For the convenience of covering, it is best to leave two feet paths between beds of nine or ten plants, laid side by side in the cross rows; and lay each row so that the tops do not overlay one another. Likewise, for the winter use, May and June sowings may be planted out to gain strength upon north borders; and they will become fine stocky plants for laying, by the time frost comes to point out the necessity of laying and littering over. I find my north borders to be of equal importance to my south borders.

I intend to send you some plans of the most approved hothouses, for various purposes of Horticulture, soon, and I hope you will see that justice is done to the engraving.

ARTICLE VIII.

ENQUIRY INTO THE AQUATIC HABITS OF THE MELON PLANTS.

By the Author of the Domestic Gardeners' Manual, C. M. H. S.

DURING the course of the late autumn, I addressed several papers to the London Horticultural Society, upon various interesting phænomena connected with the subject of this article. As a member of that society, I believed it right, in the first instance, to present my communication to it, as to the fountain head of horticultural science; but having done so, and to an extent that can leave no doubt in respect of the machinery I employed, nor difficulty in bringing my experiments to the severest practical tests, I now feel not only at liberty, but called upon, to place before your readers the results of my discovery.

By referring to Vol. 2, of the *Horticultural Register*, page 98, the form and arrangements of the small forcing-house in which I produced my fine Housainee melons in 1832, will be ascertained. The length of the house was subsequently increased, by the addition of a light, and the structure of the pit was materially changed. The flue, instead of running along the back wall alone, was carried by the east end of the pit, ran along the front and west end, and was so placed that, throughout its whole course thus described, it formed the base of the pit, which was completed by a brick wall of four-inch work, of sufficient height capped with the kerb or shelf. So arranged, the whole heat from the inner face of the flue was thrown into the pit; and therefore, I had the leaf-bed cleared out, and an air chamber constructed, by a covering of planks, to the height of the flue,

but sloping upwards to, and resting upon a set-off, in the back wall of the pit.

Upon the boards, a bed of light soil, consisting chiefly of very sandy earth, and half decayed leaves, was deposited. I mention this, because the nature of the soil intended for another object, had some effect upon the melon plants I shall refer to; and again, because the following remarks may,. in some degree, weigh with gardeners, who contemplate the formation of an air-chamber, as a means of affording heat to a bed of soil, and likewise to the atmosphere of the house. In two of the boards at opposite ends of the pit, holes were cut of a size to receive two sheet-iron pipes, for the egress of the warm air. I found my plan of the chamber to answer exceedingly well, as long as fires were required; for by pouring water down the pipes, and forcing it into the pit by a large syringe, through other openings in the pit wall, a moist and genial warm air was brought into the house at pleasure; and thus also, the reserve heat of the flue, that was pent up in the chamber by plugs placed in the pipes, was made available, whenever it seemed to be required. The soil likewise of the bed was easily kept to the heat of 70 or 75 degrees. But when fires were dispensed with, the advantages of the chamber were lost, and some injuries were sustained by the plants without pots in the soil of the bed, which had been excited by the previous temperate warmth of the earth. To finish this matter, which would become foreign to the business under enquiry, I observe that, I consider such chambers as delusive, and far inferior to the old leaf, or tan bed, and this season, have altogether given up so uncertain and changeable a medium of heat. In fact, it must be admitted that, a bed of soil resting upon a platform above a heated chamber, is very liable to become parched; and it must rapidly lose all its heat, unless fires be kept up in every season.

Early in the last spring, I received some seeds of Asiatic melons: I sowed a few in pots, and having no other fitting situation for the plants, I finally turned the seedlings out of the pots with their balls entire, and placed them in this bed of inappropriate soil. Among the plants, was one of the striped Housainee, and this was placed at the east end of the pit, close to its wall, and not far above the flue, near its first turn to go along the front. Upon the covering tiles of the flue, without the pit, I caused a little cistern to be made of bricks, laid in roman cement. The cistern was intended to contain water, and yield vapour to the atmosphere of the house; it therefore was cemented within; and as the tiles of the flue, and the end wall of the pit, formed, as far as it extended, two of the surfaces of the cis-

tern, each mortar joint was secured by a coating of the cement, so as to render every part water tight.

Under these circumstances, the regular culture was continued; water was occasionally poured into the cistern, and nothing material occurred that required notice, till about the second week in July, when a small portion of roots was perceived to emerge from the wall of the pit through a mortar (cemented) joint, into the water of the trough. At first, this was not noted down, but on the 19th, the roots spread so rapidly, and assumed so branching a form, were so vigorous, and evidently in their appropriate elements, that I made the following entry in my diary, having carefully investigated the soil, to leave no doubt of their origin.

"The roots of the Housainee have formed the fox tail, in the water-trough, in several tufts of straight fibres, furnished with laterals: it is singular, if water, in profusion, should prove suitable to melon growth."

The roots were as hardy as they were luxuriant. On several occasions, the water was almost dried away, as the flue heated it much, yet still they suffered nothing: as soon as fresh fluid was added, they expanded again, and appeared unhurt. Finally, they almost filled the trough, and then, I determined to record the facts I had observed. One fruit was swelled, but under most unpromising circumstances: the soil was bad, the plant injured by the alteration of a part of the house, and the leader above the melon was broken by accident. It ripened however; and as I deemed it, though small, to be an object of interest, I not only drew up a statement of the facts for the committee of the Horticultural Society, but sent the fruit to Mr. Loudon for investigation, with a simple recital, in a few lines, of the concomitant attending its production. I enclosed a small parcel of the roots in a phial of water, and this I did likewise to the secretary of the society. The remaining portion of the roots in the trough was then taken off to the point where they emerged from the wall, and then I was enabled to discover the extent of this curious process. The trough, as I have said, was almost filled with roots, but on inspecting the joint of the brickwork, whence the roots emerged no fissure or hole was discernible. Upon removing some of the soil within, I could trace a long branch of the root which passed close to the bricks, and at a certain point had been stimulated to send forth, through the mortar joint, the process that formed the bundles of fibres in the water cistern. I now retain a fine specimen of these water roots; they are in alcohol, and their texture and white colour are perfectly preserved.

Mr. Loudon, unfortunately, did not see the fruit I sent, as he was in the country. In the number 46, of the Gardeners' Magazine, page 591, he highly notices the few observations I enclosed with the specimens. But as I had not communicated all the facts necessary to furnish a fair statement of the nature of the phenomena, I owe it to him, as soon as leisure shall permit, to place before him a full and candid recital of every particular. In the meantime, with great pleasure, I add that, the highly gifted president of the Horticultural Society, and the learned and accomplished botanist, Dr. Lindley, have, each, severally, given me to understaud, that the facts ascertained by me, have gone so much farther than others which had heretofore presented themselves, that it would not be at all surprising, were they to lead to some material alteration and improvements in cultivating the melon.

I am aware, and many reading gardeners must be equally so, that the melon in Persia is grown in ground irrigated by little streams, into which doubtless, many fibrous bundles of roots pass; still no use had been made of this known fact; but now, that I have proved the melon so attracted, as to send masses of feeders through a water-tight joint into a body of water; that the roots absolutely revelled in the element; and, instead of decaying, becoming torpid, or tending to impair the fertility of the growing plant, had enabled it to yield a fully matured fruit, I say, as these facts have been undeniably authenticated, I hope that no one will consider an acid, hard, and heavy soil as indispensable to the perfect growth, and fertility of the melon plant.

Having carefully observed the healthy ramification of the roots of a full-grown plant, I resolved to acquire some collateral evidence; and therefore took cuttings of two or three joints from melon and cucumber plants; also, others of the leaves of each, the latter comprising the entire footstalk of each leaf, but not the vestige of a bud. I placed these cuttings and leaves in glass bottles nearly filled with water of different kinds; some being hard, some perfectly soft, while some was slightly medicated with nitre and camphor. I plunged the phials in a gentle hotbed of leaves; and found, with scarcely an exception, that all the cuttings, in simple water, whether that were soft or hard, emitted roots in a very short period.

The cuttings in the medicated fluid did not succeed so well by any means. During the warm weather from four or five to seven or eight days, sufficed to procure a sufficient number of roots to insure the immediate success of the plants, when removed to a pot of soil.

A single leaf of a cucumber produced by far the largest mass of fibres: it lived for a time in soil, but developed no shoot.

The short, damp days of autumn, with proportionate absence of sun-light, checked the progress of my experiments, and as I kept up no great degree of artificial heat, I suffered my plants to decline, which, in rising spring would have rapidly attained a fruiting condition, as several of them showed blossoms and germs by the close of October.

Not to dwell longer on experiments which I do not consider as concluded, I shall only remark,

That I have proved the *Persian Housainee plant* to court water, as a medium, wherein its roots will flourish; and that, this melon, also my variety of the Germek, and the Scarlet Fleshed, will take root in water, if assisted by a very temperate bottom heat, during September or later. Also, that the cucumber plants, and the single leaves of large size, will root speedily by the same treatment. I had in December, a small cutting, that took root in a phial, placed on a cool part of the flue, and was transferred to soil very lately.

With these facts before me, I offer the remark with confidence, that gardeners, who can command ample machinery, have sufficient reason to proceed in a course of experiments, which may induce a total alteration in the mode of cultivating the *cucumis* tribe, and reduce it to a process of certainty, and of ample remuneration.

January 7th, 1831.

ARTICLE IX.

SOME OF THE CAUSES OF BAD WALL-TREES.

BY MR. W. DENYON,

Gardener to Lady Webster, Battle-Abbey, Sussex.

DURING these last few years, I have had opportunities of seeing many gardens, both in the north and south of England, and must say, I have seen very many excellent wall-trees, and also very many not at all deserving either the situations or soil in which they grow. Bad wall-trees are certainly very disgraceful to a good garden, and far from being any ornament to a bad one.

I have endeavoured to ascertain the cause of so great a number of bad trees, and from a variety of observations, I am brought to the following conclusions:—

That trees are often injured by being planted very injudiciously; that the soil in which they are planted is frequently very unsuitable for them; and that they often lie a long time out of the ground, after they are taken up, before they are planted again.

Some persons, when employed to plant them, will take a spade in one hand, and the tree in the other, and go to the place where it is intended to plant it. The tree is then laid down, but no care is taken to prevent the roots from drying during the time the hole is being prepared for it. A small hole is made, and a little bit of fresh soil put in, into which the tree is immediately thrust, and no further notice is taken about what it will require for its future growth. It may be a bed of good soil, and in that case the tree may thrive for a time, or the soil may be little else besides clay and gravel; then the tree will canker and die.

Injury in planting may arise from the person who is employed to plant, not understanding properly how to perform the work, or if he does, he may not be inclined to take proper pains with it.

Besides, however well the operator may understand his business, and whatever pains he may be inclined to bestow, the proprietor may not be disposed to allow him the proper materials or means. In either case the loss is certain.

The border requires well trenching and manuring, and if the proprietor supposes this expense unnecessary, and will not allow it to be incurred, then the loss of the trees is almost certain. I am happy, however, to say, that it has never yet been my lot to serve masters of this description.

When a new wall is built, and the soil is not good, where the border is to be, the bad soil should be taken out to the depth of three feet, for eight or ten feet wide, and the bottom should always slope a little towards the front. A quantity of brickbats, stones, and other hard rubbish should be laid at the bottom and well beaten down; a drain should also be made at the front, a little lower than the bottom of the slope, to take off all superfluous moisture, which, when not carried off, I believe to be one great cause of the trees cankering.

The border should be composed of half good rich loam, a little more than one-fourth of well rotted dung, and another fourth-part of road scrapings and vegetable mould. The loam should be the top-spit, taken from a field or common where sheep or cattle have long fed, and the whole mixture should be well incorporated before the trees are planted.

When all is ready, plant the trees, spread the roots carefully, and cover them with about four inches of soil, broken fine. Then mulch

them with rotten dung, and nail the branches slightly to the walls, until the border is settled.

Wall-trees planted in this manner, and well managed afterwards, will, in a few years, more than cover all expenses, and will add much to the good appearance of a garden.

Dull weather is by far the best for planting fruit trees. The best time is from the middle of October to the end of November, and again in spring, as soon as the weather will permit.

Preparation should be made in winter for spring planting; autumn is the best time if it can be conveniently done. Old borders may be renewed by manuring and trenching; but more of this at a future time.

ARTICLE X.

COLLECTIONS AND RECOLLECTIONS.

Fumigating Plants.—It is a practice with many gardeners, to syringe their greenhouse plants previously to fumigating the house with tobacco. The water secures a great number of the insects from the effect of the smoke, and so a remnant are left to perpetuate the race, and cause the necessity of a repetition of fumigation more speedily. I am a friend to the contrary practice.—Observaticus.

Barking of Trees by Rabbits and Hares.—In answer to a Query in your late number, I beg to send you the following extract, which I lately met with in a Treatise on Forest trees, by Mr. Boutcher, published many years ago. I offer it with the hope of inducing others of your readers to favor us with any information they may possess on this subject. Mr. Boutcher observes, "I have one further hint in favor of this plant, the Laburnum, or Bean Trefoil, which alone makes it claim much attention; and that is, mixing them in all plantations infested with hares; who are so fond of them that while a twig remains, no other plant will be touched; and though eaten to the ground every winter, they will spring with additional vigour the succeeding summer, and constantly supply these animals in luxury. This to my certain experience, may be depended on; and the produce of five shillings worth of seed, properly raised and distributed, will furnish plants enough to protect 500,000 other trees. Many expensive and laborious experiments have been ineffectually tried to protect young plantations from these rapacious enemies. This is a cheap and no less certain remedy; and however simple

the discovery may appear, the effects of it will be of the highest consideration to every planter who puts it in practice."

FOREST TREES ADAPTED FOR PLANTATIONS.—ORNAMENTAL OAKS.—Notwithstanding the great number of beautiful hardy trees, which have been introduced into Britain during the last twenty or thirty years, many persons continue to plant their parks and pleasure-grounds with the commonest forest-trees, and generally speaking, with those indigenous to the country. Some persons vindicate this practice by alleging that the native trees of a country are most suitable to it; but we might just as well refuse to grow pine-apples, because they do not spring up wild in our woods, as reject the brilliant tints of American forest-trees, because nature has clothed ours in a more sombre livery.

It is one of the most decided marks of civilization, and one of the greatest advantages of commerce to be able to assemble, in one spot, luxuries from different parts of the world. The savage is compelled to build his hut of the logs which he has felled, and to live on the game which he has killed with his own hands, or on the fruits procured by his own labour; but the man living in civilized society has the products of a dozen different nations on his breakfast-table. Foreign commodities have become necessary for our food, our furniture, and our clothing. Why then should foreign trees be banished from our pleasure-grounds?

The prejudice in favour of native productions is not, however, the only obstacle to the introduction of foreign trees: many persons are ignorant of their beauty, and those who have heard them spoken of are perplexed by the nomenclature of a nurseryman's catalogue, and are afraid of ordering trees designated by names which they do not understand, or which, at best, convey no definite ideas to their mind.

Every one who has been in America speaks with rapture of the beauty of an American forest in autumn; the brilliant colours which the forests then assume are said to be almost dazzling, and most persons who have read a glowing description of American scenery at this season would be glad to realise it in Britain in their own pleasure-grounds. This may now be very easily done, and at a very small expense. The beautiful reds of the American forests are principally produced by the oaks. It is not, perhaps, generally known that nearly a hundred different species of oaks may now be procured in our nurseries, nearly all of which are perfectly hardy, and may be grown with as little care as the common oak (Quercus pedunculata) of the British forests. Above forty of these oaks are from America, and one of the most beautiful of them is the Quercus coccinea, or

scarlet oak. This is a tall, handsome tree, growing about fifty feet high, the leaves of which take a most beautiful and brilliant scarlet in the autumn. These leaves are longer and narrower than those of the common oak, (they are about six inches long,) and hang on till near Christmas; the branches generally spread gracefully on every side; and the wood is remarkably hard, of a deep scarlet colour, and when polished as beautifully grained as mahogany.

One of the finest scarlet oaks in England is at the Duke of Wellington's seat at Strathfieldsaye. The laurel-leaved, or swamp oak (Quercus laurifolia,) has a very remarkable appearance, and its wood is said to be very valuable. The Quercus cerris, or Turkey oak, is very handsome; and the Leucombe oak, one of the varieties of this species, is one of the most beautiful trees that can be imagined; its branches droop most gracefully, and its leaves retain a deep shining green till they drop off in the spring, but a very short time before the buds open again for the ensuing season. Quercus rubra and Quercus palustris are both from North America, and the leaves of Quercus rubra assume a beautiful red colour in the autumn. The leaves of Quercus palustris have more of a brownish tint than a pure red, and they are more deeply indented; this tree is a very handsome one, and has a beautiful effect in a shrubbery. Quercus suber the cork tree, is very well worth cultivating for its curiosity. It is, however, slow in growth, and seldom forms a handsome tree in this country. Two of the handsomest in England are in the Duke of Richmond's pleasure grounds at Goodwood. Quercus coccifera has prickly leaves like those of the holly; from this species is collected the kermes, or scarlet die. Quercus Ilex is the evergreen oak. A remarkably large tree of this species is at Wilton, the seat of the Earl of Pembroke. There is also a very fine Ilex in the garden of Major Richardson, at Chichester; and another at Bargally, in Kirkcudbrightshire, in the West of Scotland. The leaves of the Quercus phellos are like those of a willow, and those of the Quercus castanea assume a yellow tint in autumn. The leaves of the variegated oak look like a sheet of silver in the sun; there is a very beautiful specimen of this tree at White Knights. One of the smallest oaks is the Mexican (Quercus Mexicana) which never exceeds two feet in length; and one of the largest the Quercitron (quercus tinctoria,) or black oak, generally grows to above 100 feet. Many others might be mentioned, but the above will be sufficient to show the effect that may be produced in a plantation by oaks alone, and many other trees have as many varieties. All the oaks here described may be produced in almost any British nursery, and most of them may be seen

growing at the nursery of Messrs. Loddige, at Hackney; at that of Mr. Young, at Milford, near Godalming; at the Goldworth nursery (Mr. Donald,) near Working, Surrey; and probably at many others. None of the trees are very expensive, and most of them grow freely. All that is requisite is to plant them at sufficient space apart to allow them room to grow, filling up the spaces between with common trees, which may be cut down for firewood, &c., as the finer sorts grow up. ---*Enaj.*

PART II.

REVIEWS AND EXTRACTS.

REVIEWS.

IRISH FARMER'S AND GARDENER'S MAGAZINE.

EDITED BY MARTIN DOYLE,

Author of Hints to Small Farmers, &c. and EDMUND MURPHY, late Acting Secretary to the Horticultural, and Arboricultural Society of Ireland.

In Monthly Numbers 8vo. 1s.

We have received the three first numbers of this Magazine, and after an examination of their contents, we have no hesitation in saying that the publication has started under favourable auspices. We hope it may be liberally supported, for we believe it is calculated to prove very useful to Ireland. Judging from what we know of Mr. Murphy, and from what we have seen of the productions of his colleague, who assumes the name of Martin Doyle, we have very little doubt that this will become a very excellent Magazine.

The scheme of joining Farming and Gardening together in one work is novel, and we can scarcely predict what may be the result, but it is worth the trial. Farmers, generally speaking, do not read magazines, and, therefore, by the union of both subjects, the farming knowledge will most probably be circulated to a far greater extent

than if the work were confined to farming alone. We are the more anxious it should succeed, for the sake of the country in which it is published.

Mr. Murphy, by way of apology, states, that from some peculiar hinderances, the first number is not a fair specimen. On this point, however, we beg leave to differ from him, for after looking over the subsequent numbers, we think that an excellent paper by Mr. Murphy, and several by some other contributors, render the first number equal to either of the two succeeding ones. The first five pages are occupied with an introductory address. Then follow some articles on Horticulture and Floriculture, from which we have made the following extracts:

On Raising Native Hyacinths.—The plants which have flowered in glasses or pots, produce better offsets than those raised in beds; these, together with the mother and now reduced bulb, plant at the usual season. The old bulb affords considerable nourishment to the young plants, which rise with great strength the following spring. When the leaves assume a yellow hue, the plants are to be taken up, and replanted the same day in prepared beds; the stronger by themselves. The strongest plants will shew blossoms the following spring, some of them having from twelve to twenty bells or pips; these should be reduced to three or four, which should be left on the extremity to draw up the sap. Were the whole suffered to remain, the plant would be much exhausted in flowering; and if wholly taken off, it receives a great check. The bulbs are again to be taken up in October, and replanted as before, not permitting them to remain any time out of the ground. Moisture seems essential to the perfection of the Hyacinth; and I find that those which remain in the ground, and of course subject to its influence, are not at any time affected with the ring disease, by which many of those which are placed in the store are lost every season.

The Compost best suited for them is, one barrowful of loam from rocky places; one ditto well rotted cow-dung. This should, if possible, be three years old; one-third of a barrow of mould, produced from rotted tree leaves, and about a fifth of a barrow from an old cucumber bed. With this, the bed is to be made two and a half feet deep, and the surface covered with turf mould, to preserve the bulbs from frost.

To preserve Vines and Peach-Trees from Mildew, Green Fly and Scale.—Slake two pounds of roach lime with about six gallons of water; after it has stood sixteen or eighteen hours, I pour off the pure water, and mix it with four gallons of soap suds. I

syringe with this mixture at the time I put on the sashes, and again when I begin to force. Should either mildew, scale, or green fly, make its appearance, I syringe repeatedly, often three times a day, chusing the hottest part of the day, in order to produce a vapour in the house; and this I continue until the fruit is nearly full grown: it must be discontinued, however, as soon as the fruit begins to change, lest it might impart a disagreeable appearance to them.

Culture of Commelina coelestis.—Sow the seed on a moderate hotbed with the other annuals, about the middle of February, or earlier; but in the latter case it will be necessary to pot the plants, and keep them under glass until the beginning of May, when they may be turned out into the flower ground; or it may be sown in the open ground in the beginning of March. The ground should be moderately rich and light, although any ordinary garden mould will answer; cover the seed half an inch deep with light sandy-earth; and should the weather prove genial, the plants will appear in about a fortnight, and require no farther care then to be kept free from weeds, and watered in very dry weather. By the beginning of July the plants will be in blossom; and either in beds, masses, or as solitary plants, add greatly to the beauty of the flower border. Persons possessing the plant may have it in blossom in May, or even earlier, by treating the roots as we do those of the Dahlia, viz.:—planting them in pots and plunging the pots in a moderate hotbed, placing them in decayed leaf-mould under glass—here they will soon vegetate, and may be placed in the open ground as soon as danger from frost is not any longer to be apprehended. By treatment which every gardener understands, such as sowing at different seasons, the plant may be made to flower at any time, or be kept in blossom all the year round. The roots require, in order to preserve them from frost, only the ordinary care of placing a few inches of sand, turf-mould, ashes, or the like, over them as they stand in the bed, or they may be raised and preserved in sand in the manner that carrots are sometimes kept during winter.

Culture of the Mushroom.—Towards the middle of October, I empty the melon pits of the old dung, tan, or tree leaves, reserving any that appears fresh, which I mix with fresh stable dung, and return to the pits, first placing a layer of entirely fresh dung at the bottom. I tread firmly as I proceed. When the pit is quite filled, I put on the sashes, tilting them to permit the escape of the steam. In a fortnight or three weeks, the dung will have subsided, and the heat will be sufficiently abated. I then place a layer of a few inches thick of horse-droppings, from a stable where the horses are fed on

hay and oats only, and which droppings must be well dried previously to being used: this layer is to be tramped, and the spawn, in lumps about the size of a goose-egg, is to be placed one lump in each area of six inches, and covered with about three inches of fresh loam from a pasture, and beaten down well with the back of the spade. Dry hay is to be placed upon the surface of the bed, and air admitted in fine weather. The layer of droppings soon becomes a continuous mass of spawn; and the quantity of mushrooms produced throughout the winter and spring, is truly astonishing. Water will be required occasionally, particularly as the days begin to get warm in spring. Towards the beginning of May, when the pits are required for other purposes, abundant spawn may be preserved for future operation.

Culture of the Potatoe Onion.—Fresh manure is highly injurious to every kind of bulbous root: a sandy soil, with a well drained bottom, is the best; but any good ground will answer that is free from springs near the surface. The ground should be dug and well broken to the depth of two feet, if possible, and a compost spread four inches deep on the surface, composed of the following materials:

Well rotted cow-dung....................	one fifth,	or equal parts.
Grey sand—if shelly, so much the better	one fifth,	ditto.
Turf mould	one fifth,	ditto.
Good sound fresh earth.................	one fifth,	ditto.
Coal ashes	one fifth,	ditto.

The bulbs should be laid in rows fourteen to sixteen inches apart, and six or seven inches from one to another in the row; they should be barely covered with the hoe in the first instance, as they must have time to strike and swell before they are encumbered with a weight of earth. Plant the bulbs in September, October, November, and December, and cover them gradually until a mound is raised about six inches high, and four or five inches broad at the base, according to the size. In the month of May, or perhaps in April, the onions may be again uncovered and exposed to the sun, and remain uncovered until they are ripe. This practice accelerates their arrival at maturity, and greatly diminishes the trouble in saving them. In taking up the onions great care is required not to separate the small bulbs which grow in clusters on the tops of the large ones; these might be removed a few weeks before you dig out the large bulbs. They should be planted again in masses, taking care to remove any of them that may have become soft or decayed; in this way they nourish and assist each other; but if by any accident the clusters should be broken, they may be planted separately.

Notice of a Submarine Forest on the West Coast of Ireland, by Mr. Murphy. This very singular phenomenon occurs on the eastern shore of the Island of Aranmore, on the coast of the county of Donegal. It was pointed out to us in 1827, by the boatmen who conveyed us from Rutland to Aranmore. The stumps of the trees are of various lengths, from a few inches to six or eight feet above the bog stratum on which they originally grew. This stratum is now below the surface of the sea; and at high water the whole remains of the forest are from six to twenty feet beneath the surface of the water. When the tide is out, a considerable number of the stumps are dry, and appear to protrude from sand, but this sand is merely a covering which has been superimposed on the bog. The stumps may be observed by a keen eye at an immense depth beneath the water, as we approached the main land. Submersed forests have been discovered on the eastern coast of England, and in Scotland. Their existence has been variously accounted for, by supposing that the bed of the waters of the ocean maintain a higher level now than they did formerly; or, that owing to some convulsion, the land on which the trees grew has subsided. The most satisfactory reason which has been given appears to be, that the bog and the trees which it supported, moved, as we know bogs frequently do, from a higher to a lower level. This, from the appearance of the land, appears to have been the case at least with the submarine forest on the coast of Donegal.

Culture of Tulips.—The compost best suited to tulips is

Sea sand..........................	one eighth.
Turf mould.......................	one eighth.
Fresh earth.......................	one eighth.
Leaf mould.......................	one eighth.
Cow dung	one eighth.

Unless the two latter are very old, indeed, it is better to exclude them altogether, and increase the quantity of turf mould and sea sand. This compost having been well mixed, and repeatedly turned, until its parts are completely and equally incorporated, which can be best accomplished by passing it through a coarse lime screen, should be placed on your ground (which had been previously completely broken up two feet deep) four inches thick. The best aspect is east or south; the beds should be about four feet wide, and have a fall of at least eight inches. Give your ground time to settle, say ten or twelve days, then mark your beds with the handle of a hoe, pressing it a little down, in rows eight inches assunder. Then put your tulips in three rows, six inches apart; they are merely to be placed

on the surface, pressing them in a little and gently, so as to fix them in a proper position. Then cover each row separately with the same compost before recommended, in such a manner as to form small ridges about four inches high. If planted in a southern aspect, these ridges should run north and south, if in an eastern aspect, east and west, the blossom bud of the tulips should always face the sun. The tulip root is, in a degree, conical, flattened a little at the base on one side;—here the bud lies from which the flower stalk proceeds; the leaves proceed from the top of the cone, the flower stalk passing beautifully through them. The Dutch are so careful not to injure the bud, that they always leave one or two inches of the flower stalk adhering to their tulips, when in a dried state; it is chiefly for want of attention to this simple process, that tulips are seldom found two years successively in an equal degree of perfection.

To Propagate the Rhododendron from Seed.—February is the season that the seed of this beautiful plant is ripe, and it should be gathered on a dry day, and spread on paper, laid in a warm place or before the fire, until the capsules open, which will be in the course of eight or ten hours, when the seed may be easily shaken out. In March, choose a piece of ground in a sheltered situation, and shaded from the mid-day sun; prepare a piece of ground by digging and breaking it very fine, then lay six inches of fine sifted turf mould over. Sow the seed thick on the surface, and cover it with dried moss, finely chopped and rubbed small. Then give a hearty watering, with a fine rose, in order to wash the seed into their mould. The use of the moss is to protect the young plant, and should not be removed. The plants will be ready to plant in nursery rows the third year after sowing, and should be planted in the same sort of mould as directed for the seed.

Culture of the Ranunculus.—Remove twelve inches of the surface earth from your beds, taking the level from your walks, then have the earth at bottom well dug or broken up eighteen inches; or if it will admit of it, two feet more in depth. Then lay in manure seven inches in thickness over this, say three parts of cow-dung, six months old, and a fourth part of sand or mud, obtained, if possible, from the bank of a river, well mixed together. If this manure be prepared a few months before it is used, and occasionally turned, the better; over this place a compost of five inches of the following materials:—

Cow-dung mould, three years old, if possible,......... one sixth.
Sea sand, ... one eighth.
Turf mould, ... ditto.

Leaf mould, well reduced,................................ one eighth.
Fresh sound earth, ... one third.

Your beds will now be some inches above the level of your walks, but in a week or ten days they will sink down considerably; you might give the beds a slight fall, say one-fourth inch to a foot; but as the ranunculus requires a continual supply of moisture, a greater fall than this would be injudicious. When your beds are in a proper state, make impressions or drills across them with the handle of a hoe, by pressure, about one and one-fourth inches deep, and five inches asunder, and plant your roots at four inches distance from each other; then fill up your drills with the same compost. The ranunculus should never be planted deeper than one inch from the surface, as light and air seem to be essential to their very existence. By adopting the plan laid down above, your roots will be about four inches from the manure, at which distance sufficient nourishment will be obtained; but if the roots come at all in contact with manure, they will be inevitably lost. It would be well to remark, that cold, or naturally wet ground, is unfit for this plant, for although the ranunculus likes moisture, it prefers partaking of it passing—for this reason, the bottom of the beds should have a quantity of gravel thrown in, if at all wet or cold; indeed, such ground ought to have sewers for carrying off the surplus water. An eastern aspect is the best; but a southern will answer very well, provided it is a distance from the garden wall. Ranunculuses should never be planted within twelve feet of a wall or hedge. Anemones may be treated in a similar manner.

From these few extracts taken from the gardening portion of the work, our readers will be able to form a tolerably correct judgment of the abilities of the contributors. Our selections have been limited to the first three numbers. Each number contains 56 pages of letter-press, comprising Original Communications on Agriculture, Horticulture, Arboriculture, and Floriculture; Also, Miscellaneous Intelligence, comprising Extracts from other periodicals, Agricultural Exhibitions, and Monthly Calendars on Horticulture, Arboriculture, and Agriculture. Queries and Answers, and Collections of Useful Scraps from various sources. We think the whole well calculated to awaken a spirit of enquiry amongst the gardeners and farmers of the Sister Country, which may eventually issue in the most beneficial results.

HORTUS WOBURNENSIS,

A DESCRIPTIVE CATALOGUE OF UPWARDS OF 6000 ORNAMENTAL PLANTS,

CULTIVATED AT WOBURN ABBEY.

With numerous illustrative Plans for the Erection of Forcing-Houses, Green-houses, &c. and an account of their management throughout the Year.

BY JAMES FORBES, A. L. S. C. M. H S. &c.

Gardener to His Grace the Duke of Bedford, K. G.—8vo. 456 Pages.

Twenty-Six Lithographed Prints, and One Copper-plate Engraving.—Medium Paper, 21s.; Royal cold, £2. 2s.

WHENEVER a new Work is placed in our hands, we have no small pleasure in being able to speak favourably of its contents. It is not to be expected that every trifle will meet with acceptance from a discerning public, particularly when the subjects treated are of great individual or national importance; as is the case with the cultivation of fruits, vegetables, and flowers.

The present Volume, although its *title* seems to indicate a work of local, or of very limited interest, is yet of general utility. In saying this, we only do justice both to the author and our readers.

It is not precisely of the character we should have preferred in a work of the kind; for we are strongly prepossessed in favour of conciseness, and would have all knowledge compressed into as small a compass as possible; in order that such knowledge might be more generally diffused. And though this is not strictly the case with the "Hortus Woburnensis," yet, as practical gardeners, in offering an unbiassed opinion, we must say that its contents, compared with some treatises we have had occasion to notice, are worth three times the money. All the modes of culture therein detailed, we feel satisfied, have been fully proved by Mr. Forbes, before he brought them before the public, and though scarcely detailed so concisely as we could wish, we know from experience they may be fully depended upon.

Woburn Abbey is popular for its splendid collection of plants, and the first part of the work contains a descriptive catalogue of them. The generic and specific characters which are given in abbreviated terms, are fully explained in an accompanying glossary.

The second part comprises the plans of parterres, pleasure-grounds, green-houses, plant-stoves, heathery and other erections, with a description of the different subjects enumerated, the soil, and the general management best adapted for the growth of the Cape, Botany Bay, and other exotic plants.

A few extracts will convey a far better idea of the work than any thing we can say respecting the manner in which the author has treated on the various subjects. We have selected the following remarks:—

"ON THE PROPAGATION OF GREENHOUSE AND CONSERVATORY PLANTS.—The propagation of greenhouse and conservatory plants will require to be performed at various periods throughout the year, as the cuttings should be put in according as they appear in a fit state; that is, when the young shoots begin to

assume a brownish colour, and are getting of rather a firm texture, as many of the sorts are liable to damp, or rot off, when the wood is soft and young. But, previously to the preparing of the cuttings, there should be a pot or deep pan got in readiness, well drained and filled with the soil or sand, as the nature of the plant may require. The hard woody kinds will strike root best in sharp sand, while the soft or herbaceous-like sorts will root freely in a mixture of sand and loam. There should, also, be got ready the frame for sowing tropical seeds, &c. into which such sorts as require a little bottom heat may be plunged as soon as they are put into the cutting pots. Those species which are put in early in spring will succeed better by the assistance of a gentle heat applied around the pots; but when the season is more advanced they will readily strike root without it."

"In preparing the cuttings, care must be taken not to injure the bark in the removal of the leaves, which should be cut off close to the wood, as far as is necessary for that part of the cutting to be inserted in the soil; none of the upper leaves ought to be shortened or removed, nor should they be planted deeper in the soil than is requisite for the fastening of the cuttings; when they are put in, a little water should be given, to settle the soil or sand more firmly about them. As soon as the wet has evaporated from their leaves, they should be removed to the propagating frame, and if covered with bell or hand-glasses, the surer, in general, will the success be; although many of the sorts will strike very freely without them, provided they are not exposed to too much air, and are shaded from the effects of the mid-day sun."

"The cutting pots will require to be frequently examined, and should not be permitted to become either too wet or too dry, but be kept in a medium, vegetating, state of moisture. The glasses will require occasionally wiping, to prevent the damp from injuring or rotting the leaves of the cuttings. As soon as the cuttings have struck root, and begin to grow, they ought to be immediately potted off in small sized pots, and replaced in a frame, where they can be gradually hardened, and acclimated to the temperature of the greenhouse, previous to their removal out of that department. There are, however, many species of plants, we cannot propagate by cuttings of their branches, and we are, consequently, obliged to have recourse to other means of propagation to increase the stock, such as by grafting, budding, laying, inarching, and the saving of seeds."

"The most natural and successful method of procuring plants, is unquestionably by seeds: but as many of our most valuable sorts do not flower in this country, no seeds can ever be obtained in this case. There are, likewise, several kinds that can be readily increased by cuttings off the root, which will not propagate from the shoots, or produce seeds freely. When, however, a collection of seeds can be procured from abroad, in a recent state, there is a great chance of obtaining new or rare plants; a portion of such should be sown immediately on their arrival, as many of them will be found to vegetate when first received, that would not, if kept to the ensuing spring. Those from a tropical country will require a moderate bottom heat to assist their germination."

"Seeds from New Holland, the Cape, and other mild climates, will vegetate readily by being placed in a cold frame, or in a cool shaded part of the greenhouse, and kept regularly supplied with due proportions of water, so that the soil in which they are sown may be kept in a moist vegetating state. The greenhouse plants, as well as all other scarce sorts, which have flowered during the

season, should be carefully examined, to see if they have perfected their seeds, when a collection of all the most valuable species should be gathered, as they ripen, and should be laid up until the following February, when a general sowing should be made."

"The seed pots ought to be well drained with broken crocks, or small stones, or cinders, and then the remaining space filled up with light sandy loam and peat, well incorporated together, and finely sifted for the small seeds. As all the sorts will not vegetate at the same time, some will make their appearance in a few weeks, whilst others may remain dormant for nearly two years, and afterwards vegetate, we must, therefore, never be too hasty in throwing away the seed pots, until we are thoroughly convinced that there is no chance of any of the remaining seeds coming up."

"As soon as the seedling plants appear above ground, they should be carefully watered, with a fine rose watering pot; and when they get a little advanced in their growth, should be potted off into small pots, and replaced in a frame, when they can be shaded and attended with water until they get established in their pots, and are hardened by degrees to the temperature of the greenhouse, to which they should be removed. Such plants as appear to be drawn up weakly, should have their tops pinched off which will induce them to shoot into handsome bushy plants."

MANAGEMENT OF HOTHOUSE PLANTS.—"The house intended for the growth of stove or tropical plants, should be constructed so as to give a proper command of artificial heat in the winter season, when a high temperature is requisite for the preservation of the plants. These, being natives of warm climates, require a strong degree of heat, to induce them to grow and flourish in the confined apartments that are allotted for their cultivation." * * *

"The soil that appears most appropriate for the growth of the greater portion of stove plants, is sandy loam, consisting of the sward from a pasture, which should be thrown together in a heap, to decompose and pulverize for a short time previous to using; to which a portion of peat soil, mixed with it, will be a suitable compost for the growth of most tropical plants. When there is a scarcity of peat, a mixture of decomposed leaves of trees may be applied in its stead, with great advantage. Should the soil not be of a naturally sandy quality, a little sand should be intermixed, so as to render it light, and free for the roots to run in."

"The pots in which they grow must be well drained with small pieces of potsherds, or any other material that will permit a free passage for the superfluous moisture. There should be placed next the drainage a little of the rough fibrous substance that is collected from the soil, which will admit of a ready penetration of the water through it, and prevent the mould in the pots from becoming too much saturated with wet; as nothing is more injurious to the tender roots than to have the soil *scoured* about than when in a dormant state."

"Most sorts of tropical plants are increased, either by cuttings, seeds, or dividing the roots, whence offsets of the Orchideæ and Cryptogamia genus are procured; and when those throw out such suckers, or side offsets, we have a plant supplied with roots immediately, which may be at once potted, and treated accordingly. These suckers, or offsets, should be allowed to form good roots before they are taken from the mother plant. The hard woody kinds may be propagated by cuttings, which will root freely, in most instances, when planted in

sharp sand, and placed in a shaded situation of the stove, or any other apartment where they can be shaded from the effects of the mid-day sun; as a small pit or frame is generally appropriated to this purpose, which can readily be shaded by throwing a mat over the lights while the cuttings are striking root. Some of the species will require a slight degree of bottom heat, to induce them to throw out young roots."

"The most suitable season for propagating tropical plants, is from January to July: but many of the kinds may be put into the cutting pots at any period of the year, providing the young shoots are in a proper state, as some species require the wood to be ripened and firm before they are put in; whilst others may be increased when the shoots have grown only sufficiently long for the cutting."

The third part of the work is devoted to plans and details relative to the kitchen-garden department, with lists of the fruits cultivated; and it comprises numerous designs for the erection of forcing-houses, culinary pits, &c. with an account of the materials best adapted for their erection, and the mode of heating by hot-water pipes, &c.; and lastly, the general routine of culture pursued throughout the year in the forcing department.

On this third part we might offer some lengthy observations, and also make useful extracts from it, but we must be excused for want of room. We would only remark, that the mode of treating by hot-water in use at Woburn, is far more successful than we ever saw it at any other garden. We intend very shortly to explain it more particularly by an engraving.

There are twenty-six plates, all very well executed, and we can say with truth that the work, on the whole, is well worthy of public patronage. J. P.

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THIS is a work of much value; it is the production of one of the principal, if not of the most eminent comparative amatomists of the day. No. 7, which now lies before us, contains three plates, having six figures of Mammalia, very nicely coloured. The descriptions are brief, and but of little interest to the general reader, yet from the number of plates, and the accuracy of the descriptions, the work will be a lasting treasure as a book of reference, and on account of the smallness of the price, it will find its way into many hands. We can recommend it, as being well worth the money, to every Naturalist, who may want a work of the kind.

A TREATISE,

ON THE

ARTIFICIAL GROWTH OF CUCUMBERS AND MELONS,

Conjointly with that of Asparagus, Mushrooms, Rhubarb, &c. To which are added,

BRIEF OBSERVATIONS ON THE GROWTH OF EARLY POTATOES,

BY JOHN SMITH,

Nearly 20 Years Gardener to Dykes Alexander, Esq. of Ipswich.—7s. 6d. 12mo. 60 Pages.

ANCIENT HISTORY furnishes us with the information that cucumbers and melons were held in great esteem, not only by the inhabitants of eastern countries in general, but also by the Jews themselves; and in Numbers xi, 4, 5, the writer says, that "the mixt multitude fell a lusting, and the children of Israel wept and said, we remember the fish which we did eat in Egypt freely; the cucumbers and the melons, and the leeks, and the onions, and the garlic." That it was customary to set a watch in the spot of ground which was chosen for the cultivation of cucumbers, is pretty evident from Isaiah i, 8, where the daughter of Zion is said to be "left as a cottage in a vineyard, as a lodge in a garden of cucumbers."

That since its introduction to this country in the year 1573, it has been with us Britons, of all classes, a great favourite, will be readily admitted. But the climate of our country being less favourable to its growth than that of the east, artificial means are necessarily employed by us to accomplish that object which nature does for them; namely, its successful growth. Every person in any way acquainted with the nature of the plant, knows that it delights in a strong and moist heat, and that as fermenting substances afford the best which can be obtained, these are made use of for the attainment of the desired object; but when they operate, or when their heat is brought into action, it often proves that they contain and impart properties which are exceedingly hurtful, and very commonly destroy the very finest plants, and that, too, when no danger is apprehended.

On the contrary, if the pernicious properties be extracted or properly guarded against, that is to say, not suffered to come in contact with them, there is no heat so congenial to its constitution; nor is there within the Hortus Brittanicus, a plant which under a continuance of good treatment repays more gratefully all favours. The modes of treatment which are pursued in the cultivation of this plant are known to be very numerous, and the author himself having, as he tells us, dived pretty deeply into them, he feels no difficulty in describing, though imperfectly, a great number. The first noticed, is the common dung bed mode of growing. The preparation of the materials for which, that is to say, the turning over and over again, require, according to some persons account, three, others four, and some six weeks, before they are in a fit state to be made up into a bed; to which may be added two or three weeks more before the bed is in a proper state to receive the plants, being in all from six to nine weeks in making an imperfect habitation for that humble plant, the cucumber. Here is a loss of time, labour and heat with a witness, for when time and labour have been

spent, so as to reduce the heat of the fermenting substance to almost nothing, then, and not until then, is it in a fit state to receive the plants into it. That there are in practice means used to prevent these evils I admit, but so far are they from being perfect, they only serve to prove that the greatest degree of heat is exactly where least of it is required; as for instance, the well known practice of placing a slate under each hill of earth where the plants are planted, for the purpose of keeping down the steam, and of pouring cold water under them to kill the excessive heat in that part of the bed, demonstrates, not only that most heat exists, where least of it is required, but also, that a great deal of it is, contrary to what it ought to be, wasted or destroyed.

Another great evil is, the bed being composed entirely of fermenting substances; it settles so much as to render it almost impossible, after the heat has once abated, to renew the same by the assistance of fresh linings when it is required. To obviate this evil, T. A. Knight, Esq. P. H. S. has recommended the "placing a thin iron or wood n tube from front to back of the leaves or dung composing the bed, and at about one third of its height from the top. This tube is one inch and a half in diameter, opens at both ends, but is intended to be opened or closed by plugs at pleasure. Three smaller tubes of three quarters of an inch in diameter, are inserted at equal distances into the large one, which rise through the dung and mould of the bed, and discharge by lateral holes near their tops the heated air which rises from the large tube."

Further, some persons have recommended the use of platforms, on which are placed the frame, earth, and the whole are supported by posts or brick piers. The space beneath the floor is filled with hot dung, and in some cases, a lining is applied round the outside. The author had a structure of this kind under his charge for several years, and although the best cucumbers which ever came under his notice were produced in it, and Balsams sixteen feet in circumference, yet for want of a proper substance against which to build the linings, and the almost entire destitution of means to supply heat by absorbtion and conduction, experience has taught him that the principle cannot with safety be depended upon, when used for early forcing. Of brick pits, perhaps it may be said, these difficulties are removed, yet the general objections to them are, the expense incurred in building them, and the quantity of dung required to raise and keep a proper degree of warmth; but the greatest is, that the structure is fixed, and is a perpetual habitation of wood-lice, or milepedes. These pits, however, have various good qualities, which are well described by Mr. Macphail. The first and greatest of these is, "that the coldest place in the bed is exactly in the centre of each pit; plants being planted in this centre or coldest part of the bed, their roots can never be hurt by the heat increasing on each side gradually, being in every respect suitable for their increase and extension. The heat in the centre of each pit where the plants are first planted seldom rises higher than to about eighty or eighty-five degrees, nor does it ever rise higher in any of the pits than about ninety-six or ninety-seven degrees, nor do I believe," he says, "it ever can be raised higher than that, without searching by top-heat or heated air." Here Mr. Macphail is mistaken. "Whereas in a bed made of dung, the heat in the centre of the bed under the mould in which the plants are planted, frequently rises to above one hundred and twenty degrees, when at the same time, the air in the frames can scarcely be kept up to a proper degree of heat." This passage from Mr. Macphail is cited as corroborative of the fact, that a very strong bot-

tom heat is not only unnecessary but exceedingly injurious to the plants, while they are in a young state.

On returning to the objectionable parts of these pits will be found those of the "structure being fixed, and a perpetual habitation for milepedes." This latter is one so commonly understood as to render observations thereupon useless; but such not being the case with the former, the following ideas, it is hoped, will prove serviceable. When a structure is about to be formed, in which the Grape Vine, the Peach Tree, and indeed almost any other plant or plants are to be cultivated, those under whose management it is to be placed, are earnestly recommended to have it built so as to have an elevation of about forty-five degrees; but in the cultivation of the Cucumber, &c. elevation is scarcely thought of by some; and even among those who have condescended to bestow a little attention to the subject, are those who have asserted it to be a matter of little consequence. True it is that the cucumbers donot require so great an elevation as that above named, but is it right or reasonable from hence to conclude that the subject is one of little or no consequence? surely not. But we sometimes say, necessity has no law, and in this case, generally speaking, reason and right have given place to its imperative demand; for let it be remembered, that, although the cucumber requires a considerable elevation in the frame or lights, in an early part of the season, for the purpose of receiving the advantage of the rays of the sun, and also to prevent an over condensation of vapour; yet, when the season has advanced, and consequently the rays of the sun are radiating powerfully upon the glass, its elevation cannot well be too little, and in this respect the treatment which is highly beneficial to the plants in one season of the year, may be, and is injurious at another. But it has just been observed that, necessity has no law, and the case before us is a proof of its truth; for when a bed or pit is to be built, there being no alternative when finished, a middle course is pursued as a preventative to either extreme, and this may be said to be favourable or proper only in a medium or moderate state of the weather.

After stating the time and mode of sowing the seeds, and rearing the plants for the fruiting bed, he next proceeds to give us his mode of building a cucumber bed, which consists of a proper quantity of dung and earth well drained for the plants to feed in, with heat sufficient for their growth, without doing violence to them in the first instance, but capable of being renewed to any extent at pleasure, and an elevation suitable to the season. The materials wanted for the purpose are, a quantity of stones, or brick-bat rubble, a quantity of good stable dung, or a mixture of it with other fermenting substances, such as leaves of trees, a quantity of wattled work, some good soil laid where it can become dry, which should be of two kinds, one should be good sound earth, the other a composition of vegetable substances well reduced, and last a common frame and lights of the plainest description.

In building the bed, the first thing is to drive four stakes or posts into the ground, the width, length, and the intended height of the bed, which should be four feet high at the back, and three feet six inches in front. Then form the foundation of rubble and wattled work, held together by two rows of stakes, fifteen inches high at the back, and one foot in front; then build two dung walls, the height of the posts at each end, trimming the inner edges of the walls, and making the bottom of the space between them quite clean. This space must then be covered by pieces of wood, strong enough to bear the soil for the

plants to grow in, some wattled hurdles being laid upon these pieces of wood, on which place about nine inches of rather dry dung, either fermenting or otherwise for the plants to feed upon. Next put on the frame and lights, &c.; and stop up the ends at the vault with pieces of board, or stakes, and build a lining very firmly against them. A quantity of litter should also be placed against the bottom of each wall, high enough to prevent the steam or heat from passing through the rubble which forms the foundation of the bed.

Mr. Smith also uses the steam and heat in the vault, to grow mushrooms, asparagus, and other articles. This is effected by placing a common frame at the end of his cucumber bed, and admitting the heat from the vault into it, by means of a pipe two or three inches in diameter, and three or four feet long; one end of it being placed in the vault, and the other in a hole in the side of the frame.

The best means of destroying milepedes or wood-lice, in his cucumber frames, Mr. Smith believes to be first to entice them into some part by dry litter, crumbs of cheese, &c. and when collected, to pour upon them boiling water from the rose of a common watering-pot. This may be done with good effect in the vault beneath the bed.

To prevent the rank steam of the dung linings from entering, when air is given, Mr. Smith nails a strip of common Russia mat at the top of each light, so as to hang over the back of the frame two or three inches. The practice of shading the plants often, Mr. Smith disapproves, and gives air proportionate to the existing state of the heat. A few observations on the culture of melons and early potatoes, with an index, close the book.

The system is evidently a good one, and well calculated to answer the purpose; and having carefully examined the work, we can with confidence recommend it to all cucumber and melon growers. The directions are plainly and sensibly written, and evidently prove that the author is a man of close observation. To follow the directions given, it will be necessary to purchase the book itself, as the few extracts, we have taken will convey but a faint idea of the method Mr. Smith recommends.

EXTRACTS.

FLORICULTURAL INTELLIGENCE.

New and very Rare Plants, figured in the Periodicals for February.

CLASS I.—PLANTS HAVING TWO SEED LEAVES OR COTYLEDONES.

LEGUMINOSÆ, or Pea Tribe.

Gastrolobium retusum, Blunt-leaved Gastrolobium. A greenhouse native of the South coast of New Holland, whence it was received by Mr. Knight, of the King's Road. The flowers are of the same rich orange colour as the bilobium, but in smaller heads. It may be potted in sandy loam and peat, and may be propagated by cuttings.—*Bot. Reg.*

Scottia lævis, Smooth branched Scottia. A delicate yellow flowering greenhouse plant, raised from seeds, by Mr. Knight. Native of the South coast of New Holland. It requires a cool shelf in the greenhouse, in winter, and abundant ventilation.—*Bot. Reg.* Probably it should be potted in sandy peat and loam.

SCROPHULARINÆ, or Fig-Wort Tribe.

Calceolaria arachnoidea refulgens, Refulgent Slipperwort. This showy production was raised by Mr. Gillen, Gardener to Mr. Mc'Intosh, at the East India Docks, by cross impregnation with two of the numerous varieties, originated between C. Arachnoidea, and Corymbosa. The flowers are a bright rufous red. A light rich earth suits the plant best; and it can only be increased by slips from the original stock.—*Sw. Fl. Gard.*

CONVOLVULACEÆ, or Bind-Weed Tribe.

Ipomea rubro-caerulea, Reddish-Blue Ipomea. This is a very beautiful species. The flowers are large; when in bud, they are white with the limb of a rich lake red, which, when the flower is fully expanded, becomes of a fine purplish blue. Seeds of it were collected by Mr. Samuel Richardson, in the Province of Guanaxuato, in Mexico, and were by him presented to J. D. Powles, Esq. of Stamford Hill, who liberally distributed them.—*Bot. Mag.* It requires the heat of the stove, and probably will grow in peat and loam.

ASCLEPIADEÆ, Swallow-wort Tribe.

Ceropegia Lushii, Mr. Lush's Ceropegia. This is a plant of no particular interest, except for botanical purposes. It was communicated from Bombay, by Mr. Lush, to the Edinburgh Botanical Garden, where it flowered in October last.—*Bot. Mag.*

CLASS 2.—PLANTS HAVING ONLY ONE SEED-LEAF OR COTYLEDON

ORCHIDEÆ, or Orchis Tribe.

Epidendron nocturnum, Night-smelling Epidendron. This plant was so named, because, though scentless during the day, at night (like many other plants of a greenish or yellowish white colour) it yields a very powerful odour, which is compared to that of the white lily. It is a native of Martinique, Jamaica, and probably, many other of the West Indian Islands.—*Bot. Mag.* It will thrive in the stove, with the same treatment as other Epidendrons.

CALANTHE DENSIFLORA, Clustered Calanthe. This is a native of the mountains of Sylhet, whence it was obtained by Dr. Wallich. The flowers are yellow. It is a terrestrial species, growing very freely in loam and decayed vegetable matter in a damp stove; and is propagated by a division of the crown of the root.—*Bot. Reg.*

MUSACEÆ.

HELICONIA PULVERULENTA, Powdered Heliconia. All the Plantain Tribe are remarkable either for the beauty, or size, or singularity of their foliage; but this, although inferior to many in the magnitude of its parts, yields to none in beauty. It is impossible to imagine any thing more delicate than the blue bloom which thickly covers the underside of the leaves, or more brilliant than the vivid scarlet of the flower-leaves or spathes, among which nestle, as it were, a few bright green flowers.—*Bot. Reg.*

NATURAL HISTORY.

GEOLOGICAL POSITIONS.*—First Line of Argument.—1. The chalk is a marine formation, and consequently was deposited as a sediment, in the bed of the sea. 2.—As the chalk now forms an extensive member of the secondary strata of our dry lands, there must have been a time when it at first became dry land. 3, The action of the waves upon a sea coast is unceasing, and the effects of this action are more or less visible on every shore, according to the consistency of the rocks, which compose it. 4.—From the very first moment that the chalk became dry land, this unceasing agent must have operated as it still does, upon such portions of it as extended to the level of the sea. 5. From that time to the present, is the exact age of the chalk as a dry land. 6. The chalk is never superficially level, but is on the contrary, invariably of a rounded and sloping surface. 7. The surface of the chalk is always grooved out into valleys, divided by ridges of various degrees of steepness, but invariably smooth. 8. These valleys seldom contain watèr, or running streams; they consequently have never been altered in their surface by the erosion of rivers, since they became valleys.

9. Notwithstanding this absence of rivers, the chalk valleys universally open either into larger valleys, which lead to the level of the sea, or they individually point to this exact level, thus plainly bespeaking the action of the waters. 10. As all chalk valleys, unaffected by the corroding action of the waters, have this character and tendency, we are certain that all other valleys, though now cut short by precipitous sea cliffs, had originally the exact same form and tendency.

11. Our present chalk cliffs are constantly encroaching upon the lands, by a progress more or less rapid, according to circumstances.

12. As rotundity is a universal characteristic of the chalk, and as the cliffs will thus all be higher and further back, a thousand years hence, than they now are, it follows that they were more in advance, and consequently lower a thousand years ago. 13. Having the perpendicular of the cliff, and the angle formed

* The chalk formation is here selected for the establishment of the following positions, from its very marked features, and from the facts on which they are founded, having been first remarked on the chalk coasts of France and England. But the argument applied with equal force to all other secondary formations, acted upon by the erosion of the sea.

by the hypothenuse with that perpendicular, we can have no difficulty in correctly ascertaining the length of the base. 14. The length of the base is the exact amount of space destroyed by the action of the waves, since the chalk first became dry land. 15. The length of the base being ascertained, and also the rate of decay per annum, we are led with certainty to the number of years which have elapsed since the erosive action first commenced. 16. As this action is unceasing, and as the chalk is peculiarly affected by it, it never could have been in full force, even for a single century, without occasioning a cliff. 17 As no such cliffs exist, from top to bottom of the whole chalk formation, except those now in progress on the shores, the sea never could have acted upon the chalk for any length of time, except on its present level, as compared with the chalk. 18. We are thus forced to the conclusion, that to whatever elevation the chalk may extend, and it is upwards of 1000 feet in England, the whole mass was either raised at one time from the bosom of the deep, or the deep was depressed, at the same individual period, so far below its former level. 19. No stratum now reposing on the chalk above the level of the sea, could have been deposited in the sea since the present cliffs were begun. 20. The whole series, therefore, what are usually termed Tertiary Strata, reposing on the chalk, were formed in the sea previous to the elevation of the chalk, and were elevated along with it at the very same period. 21. Assuming 900 yards as the mean extent of decay of the chalk coasts of both sides of the British channel, (as indicated in the thirteenth position,) a waste of eight inches per annum gives four thousand years as the age of the chalk as a dry land. 22. As eight inches are above the general average decay of chalk cliffs at their present height, so it must have been greatly below the real amount during the first two thousand years of the operation, and may be considered as a fair general average of the whole. 23. As the action of the Falls of Niagara in the midst of the great marine formation of North America, brings us exactly to the same period of about four thousand years; as we are, in neither case, able to extend the calculation much beyond that period ; and as both coincide so exactly with what Sacred History and the traditions of all nations have handed down to us, we may look upon these latter as being most fully confirmed, as to the great and preternatural event to which they both bear witness. 24. As we know of no law of nature by which the chalk formation, and the tertiary strata reposing upon it, could have been raised, at one time, above their native element, we must conclude that this effect was the result of a preternatural power, and of an Almighty decree. 25. We are thus forced to admit a more powerful agent into our systems of geology than the mere laws of nature, to which all phenomena are generally referred ; and the science is thus placed upon a new, a more solid, and more consistent foundation.—*To be continued.*

M. Boit on the Sap of Plants.—The sap received at the roots evaporates by the leaves, whilst between these points the vegetable tissue acts precisely as a cylinder, composed of animal charcoal, covered with an impenetrable envelope, and with its lower part immersed in liquid. The column is thus supplied with all the liquid that it can contain ; the vegetable tissue becomes itself in the state of saturation that suits its mass under the existing temperature. This kind of equilibrium being established, should any cause, a sudden change of temperature for instance, increase the evaporation at the extremity of the branches, these will act by suction ; draw more from the roots, and the equilibrium is still

preserved. Should, however, the roots come to furnish more, and the leaves evaporate less, then will ensue turgescence in the vegetable tissue; and if a hole be made, the sap or liquid will overflow. This is precisely what is observed in the birch tree, in spring, when it begins to rise, and before its leaves have come forth or are able to perform their task of evaporation. As another trait of resemblance, it may be remarked, that the lateral action of heat on any hygroscopic column, such as we have represented the vegetable tissue to be, would have the effects of rendering it capable of less saturation, and consequently, would oblige it to throw out a part of the liquid it contains. This is the effect which the sun produces upon the birch, and upon other trees, whose sap runs out at this period. When the leaves come, these phenomena cease; the task of evaporation is performed, and the sap bursts neither from the bark nor through an orifice. if made. Now suppose we replace the impermeable or air tight envelope by one, on the contrary, capable of absorption from within, and exhalation from without, the state of things will be changed. The issue of the sap or liquid by the sides of the envelope will be more frequent and facile. The diminution of the exhaling power by a sudden cold will favour it, and the sap will burst forth at once from all the pores of the tree equally, taking into account merely the different degrees of thickness in the bark. Such is an account of the emission of sap by the sides of the nut tree and sycamore, in spring.

The influence of the leaves on the eternal motions of the sap in trees being thus explained, let us observe what will be the consequence, if these leaves, or great evaporating organs, be enveloped with a colder atmosphere. The sap conveyed to them being no longer evaporated, will rest and collect on their surface, and check all evaporation, especially at night. The upper parts of the vegetable tissue, or hygroscopic column, being thus overcharged, will let fall their superabundance upon the parts that are lowest, which will produce a descent of the sap. Hence proceed the alternate ascent and descent of the sap, such as have been noticed. Moreover, these effects will become continuous, if the evaporating property of the leaves should diminish before the supplying power of the root ceases to throw up the sap: and this is precisely the case in September: the same trees that afforded but their ascending sap in the spring, in September afforded a continual sweat. The latter was no longer the same as the spring sap, for it contained no saccharine principle.

Mr. Boit concludes, from his experiments, that the alimentation of the foliaceous organs is accomplished principally during the day, whilst the alimentation of roots, and the formation of new layers of them, is effected during the night, when the diminution of evaporating power in the leaves precipitates the sap in a descending course towards the roots.

That in deciduous trees, the annual increase of the trunk and branches takes place in winter. The ascending motion is thus suspended by cold, and the absence of leaves allows the sap to accumulate in the roots, which experience little of the atmospheric variations, and which, in the first warmth of spring, send up their accumulated juices with force through the uppermost parts of the tree.—*Field Naturalist.*

PART III.

MISCELLANEOUS INTELLIGENCE.

I.—QUERIES AND ANSWERS.

ARE DECAYING GOOSEBERRY CUTTINGS INJURIOUS TO YOUNG HOLLIES?—I planted a holly hedge about three years ago, which was entirely destroyed by the hares and rabbits, this was for a fence round a wood. About a year and a quarter since, I replanted it, and strewed lightly over the plants some Gooseberry cuttings, for the purpose of protecting them, which I have hitherto found very serviceable. But I am informed by many persons, that there is something in the cuttings of a poisonous nature, which will destroy the hollies, or any other plants near them. Having my doubts on the subject from actual observation, it occurred to me that you would favour me through the *Register*, with an opinion on the subject. Some of the cuttings have now begun to decay, and it has been a matter of consideration whether they are injurious when beginning to decay. If so, should the decayed branches be removed, and be supplied by new cuttings, or the old ones be allowed to remain, and merely supply the defect?

T. BUTLER.

PRUNING NUT TREES.—Can any of your readers give a detailed account of the best method of pruning nut trees? In Kent they manage to make their trees very productive. What is their management of them? X.

PREPARATION FOR DESTROYING INSECTS WANTED.—I should be glad if you or any of your readers could give me any information respecting the preparation made by West and Co., called Chalcidica, for the destruction and prevention of slugs, grubs, and all kinds of Insects on corn, vegetables, walls, fruit trees, &c. &c. as probably you or some of your readers or correspondents may have given it a trial. If so, I should be most happy to see their opinion of it in the Horticultural Register. AN ENQUIRER.

HOW SHALL I DESTROY MOSS ON LAWNS.—I shall esteem it a favour, if you will inform me what is best to be done to kill moss on lawns or pleasure grounds, as well as on gravel walks? I have tried salting, liming, and turning over for the walks; these things will do for a time, but in the course of a few weeks the state of things is as bad as ever. The moss, or as some call it the fog, has entirely destroyed the grass. I sometimes think of digging it all down, and sowing it again, unless you can inform me of something that will extirpate it, I shall be obliged to have recourse to the digging. I do not know whether it is owing to the mowing machine, having done away with the scythes. What is the best sort of Rhubarb for general use? G. E. J.

Answer.—Wilmot's and the Gigantic, particularly the first.

TO GROW LARGE CROPS OF HAUTBOIS STRAWBERRIES.—The Correspondent who, at page 43, volume 3, enquires for the means in detail of "obtaining abundant autumnal crops of the double bearing Hautbois Strawberry, will find an answer in the new part of the Society's Transactions, at page 399.

QUESTIONS PROPOSED TO G. I. T.—Permit me through the medium of the *Register* to put a few queries to G. I. T. who, with the liberality and intelligence

that marks his writings, has kindly offered his information. I wish to cultivate the Housainee Melon, and would follow most strictly his ample directions, had I a proper house for the purpose. I am only possessed of a vinery, 30 feet long, and a small greenhouse with the usual melon frames. Can I make use of any of them for the purpose, either by raising the melon frames or making use of any part of the vinery, in which the vines are trained up the rafters, and not allowed to pass over the glass? I will not mention mine own ideas, for they would occupy too much space, and would probably expose my ignorance, being myself but a tyro in gardening. W. D.

II.—OBSERVATIONS ON NATURE.

Effects of Mountain heights on Plants. M. Gay, in his recent interesting tour among the Cordilleras, discovered many beautiful and rare species of Baccharis, Leasea, Alstrœmeria, and, "above all," he says, "those charming Mutisia which exhibit the following singular phenomenon." The tendrils with which these plants are usually furnished, becoming useless in these cold regions, unprovided with shrubs or bushes, change into real leaves, organs of such great utility to alpine plants. I have also observed that the plants which are herbaceous in the plains, become here entirely ligneous; and that several trees, especially the Escallonia, instead of assuming that forked appearance which characterises it, becomes stunted, creeping along the rocks, and thus offering less surface to the cold, with which the wind is charged in passing over these numerous and immense glaciers. But another observation I have made among these cold regions, is still more interesting, it is the form of imbricated leaves, which the greater portion of the vegetables assume,—those genera even whose habitual form seems to be entirely contrary to this disposition. Thus, the leaves of the Triptilions, which are lax and small in the lower regions, become extremely hard and tough, closely imbricating the stalk, and even the flowers of these beautiful plants; the Mutisia, which is nearly devoid of leaves, when at the side of the mountains, produces at their summit a considerable number. The violets here have not that elegant form which we observe in those lower down, but are under a form altogether different; they represent a rosette, which may be compared to that of a Sedum, with this difference, that the leaves instead of being almost vertical, are in these alpine violets entirely horizontal. These leaves, which are extremely hard and tough, are round, shabrous, strongly imbricated, and exhibit at the footstalks, flowers which are sessile, and of a violet colour, somewhat approaching to red. Although very familiar with the genera Triptilian, Escallonia, Mutlsia, Viola, the particular aspect of these alpine species caused me to mistake them entirely, and I did not discover to what genus they belonged until I studied them after my return.—*Field Nat. Mag.*

Evil Effects of Turning Greenhouse Plants out of Doors during the Summer months.—The practice of turning greenhouse plants out of doors in summer may be necessary under particular circumstances, and with regard to certain species of plants; but in cases where greenhouses are properly constructed and solely devoted to the cultivation of plants, these will generally be found to be injured, rather than benefitted by this treatment, particularly when turned out early in the season. Were it possible to manage greenhouse plants during the winter as it could be wished, and as they require: exposing them to the open air in summer would no doubt be highly beneficial to them; but, from the

changeableness of our climate, and the frequent, though often unnecessary, application of fire-heat, to guard against the sudden attacks of frost, a considerable degree of excitement is induced, and before the season has arrived at which they can be safely exposed to the open air, they are all, or nearly all, in a state of vigorous growth. Without regard to this circumstance, they are at once removed to their summer quarters, when, although the frosty nights may have gone by for the season, the temperature during the night is often so low that a complete check is given to their growth, from which they seldom recover till towards the approach of autumn; when, after having regained their energy, and become, as it were, inured to their new climate, they once more make an effort to grow. From the gross habit which they have, however, now acquired, together with the lateness of the season, the shoots are seldom well matured, and the plants are, therefore, in the worst possible condition to resist the efforts of frost, mildew, damp, and other causes by which greenhouse plants are liable to be injured. But, when plants are retained under glass during the summer, both the first and second growth are ripened sufficiently early in the autumn, and, unless very improper excitement be applied, they will remain in a state of comparative rest till the following spring, when their flowers will be both more perfect, and much more abundant than such as may have stood out the preceding summer.

Greenhouse plants, however, should not be kept crowded together in the house the whole of the summer, in the way we generally find them in winter. Duplicates and all the coarser and hardier kinds may very properly be removed out of doors; and these would, in most cases, be sufficiently numerous to afford room enough for those that are left, to stand without touching each other. During the summer, the whole of the moveable sashes in the roof and front of the greenhouse, ought, except during long-continued rain or thunderstorms, to be kept open both day and night, to admit as much air as possible; and the plants should occasionally be syringed over head with water, which may be done at any hour of the day, without regard to the shining of the sun. When the roots of plants thus exposed to the sun can be preserved in a tolerably cool and moist state, their tops will not only bear the sun, but his full influence is indispensable to their health and vigour, and the full developement of their flowers.

Orange trees, camellias, and indeed all plants with coriaceous or thick fleshy leaves, are from a variety of causes liable to have their foliage injured by the sun; but this injury would seldom accrue to them were they retained in the house both summer and winter, and kept as cool as possible during the latter season. Consistently with the above considerations and provisions, fire-heat need never be applied till the thermometer in the house has indicated three or four degrees of frost.

These remarks are particularly applicable to evergreen plants with heath-like foliage, but more especially to the several genera composing the two splendid Natural Orders Ericeæ and Epacrideæ, which perhaps contain a greater number of really beautiful plants than are to be found in the whole of the other orders put together. Most of the plants belonging to these two orders are furnished with roots of an exceedingly delicate nature, but, from the fine hair-like substance of which they are composed, no plants are better adapted for growing in pots, or are susceptible of a higher degree of perfection by this mode of culture. The means, however, which enable the attentive cultivator to produce specimens of great elegance and beauty, also operate to cause disappointment where the

least neglect occurs, either in the application of too much or too little water; and these are evils which cannot always be guarded against, even by those who are the most careful. In plants having their roots confined within the limits of a garden-pot, and exposed to the sun on the shelf or stage of a greenhouse, and watered at certain periods of the day, without much regard either to the state of the weather or the degree of their several wants, it is no wonder that when so treated, some of them should occasionally appear sickly, and others of them die; indeed, it is certainly less to be wondered at than that they should exist at all.

The chief objection, therefore, to plants being kept in the house in summer is, that being exposed to the sun, the earth in the pots becomes dry, and the extremes of heat and cold, wet and dry, to which the roots are thence subjected, cause the plants to assume a brown and unhealthy appearance; and, generally, the leaves on the lower branches to fall off. These evils may be effectually prevented by using double pots, as recommended by Mr. Blair, with this modification, that his pots being intended for growing marsh or aquatic plants, require to be cemented together at the bottom; but for the present purpose, nothing more is necessary than that the empty pot, which is intended to form a screen for the other which contains the plant, be sufficiently large to receive the latter within it, so that the tops of both are nearly on a level.

Those who cultivate many of the tropical ferns, will also find it of service in preserving the delicate roots of these plants from the effects of dry heat.—Mr. Marnock.—*Gard. Mag.*

Clouds.—The clouds in which the condensed vesicles of vapour are collected, are affected by attraction, which draws them towards the mountains, and highest points of the surface of the earth. Being collected there, they undergo a change, by which they form into drops, and are deposited in the form of rain; and hence by their natural gravitation, they find their way through the pores and interstices of the earth, and in channels along its surface, forming in the one case, wells and springs in various parts of the earth, where they find a natural exit, or where an artificial exit is given to them; and, in the other case, obeying the form of the surface of the country through which they are carried, they wind in narrow channels, first deepening and widening as they proceed, and are fed by tributary streams until they form into great rivers, or spread into lakes, and at length discharge their waters into the sea.—*Lard. Cy.*

Transparency of the Sea.—Times may occur in a long voyage, when on the deep sea, the surface may be so still and quiet, that telescopes might enable the eye to penetrate many miles down, and bring to our view many of those creatures still living which are supposed to have been destroyed, and not to have lived since the creation of man. Over these immense plains, lofty mountains, and dense groves, two or three miles from the surface of the sea, far out of the reach of winds, storms, and currents, may even now exist those huge snails, the Cornua Ammonis, the Nautilus, with its proper inhabitants, the Megalosaurus, Icthyosarus Plesiosarus, Ornithocephali, Mammoths, &c. &c. All these may, most of them certainly could, live at immense depths, and in the dense air, as we know our own toads, frogs, and newts can do. No argument against this can be framed on the fact, that their recent remains are never found thrown upon any shores; because the great depth at which they live would render it impossible for any storm ever to disturb them; and if the animals lived at the bottom, their remains could never rise to the top, through such a prodigious weight of water and of air.—*Field Naturalist.*

Civet-Cat Durion Tree, Durio zibethinus, is a native of the East Indies, where it grows to a great tree. The fruit is about the size of a man's head. It is said to be the most delicious of all the fruits of India. The eatable part of it is that aril-like substance which contains the kernels, and which most resembles cream, or the *blanc mange* of our tables. But a considerable draw-back from the extreme gratification it affords to the palate of the Epicurean, is its intolerable stench. Even the rinds emit such an offensive effluvia, that at Amboyna, as Rumphius and Valentine state, it is forbidden by the law to throw them out near any public path. Some compare this smell to that of putrid animal substances, others to that of rotten onions; but all agree that if the first repugnance is once overcome, no fruit is more enticing than the Durion. It is also used as a bait to entrap the Civet-Cat, which is very fond of it; hence the specific name.—*Don's Miller's Dictionary.*

III.—SOCIETIES.

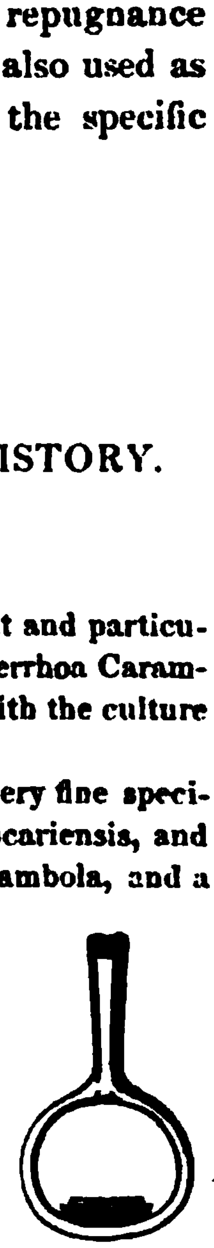
CONNECTED WITH HORTICULTURE AND NATURAL HISTORY.

LONDON HORTICULTURAL SOCIETY.

At the Meeting on the 3rd of December, papers were read containing an account and particulars respecting the mode of cultivation of the much esteemed Indian fruit Averrhoa Carambola," by James Bateman, Esq. and "Observations and Discoveries connected with the culture of Melons," by the Author of the Domestic Gardeners' Manual.

The Exhibition contained many articles of beauty and interest, especially very fine specimens of Cactus and Pereskia, Justicia, Gloxinia caulescens, Buddlea Madagascariensis, and Strelitzia. Fruit of Physalis peruviana, Gongora atsopurpurea, Averrhoa Carambola, and a seedling pine apple. "White Blossom" Potatoe (weight 2lb. 6oz) Some very good seedling Chrysanthemums, and upwards of forty handsome sorts of apple were among the other articles on the table.

The annexed Figure bears some resemblance to the head of a hoe received by the Society some time ago from Jersey, and described as being particularly useful in hoeing drill crops, beds of onions, &c. the shoulders of the ring preventing the plants from being injured.



LONDON HORTICULTURAL SOCIETY.

The Meeting for January took place on the 21st, when papers on the following subjects were read; viz. a Description of a new invented Portable Hot-Water Apparatus; By Mr. Joshua Major, of Knowstrop, near Leeds. Notes on the growth, under different circumstances, of the Oxalis crenata, by Mr. T. Corbett; and a Report by the Secretary on some of the most remarkable hardy ornamental plants raised in the Society's Garden, from seeds received from Mr. D. Douglas, in the years 1831, 1832, and 1833. Mr. Major's reduction of the Hot-Water System to the form he has adopted, was clearly shewn by a Model accompanying the communication, and from his statements, it appears likely to be serviceable in Conservatories, Greenhouses, and other places when heat is only occasionally wanted. The collections of Camellias exhibited, presented a very beautiful appearance; those from the gardens of Mr. Allnutt, of Clapham, and the Society's Gardens, were much admired, and flowers of the Astrapæa Wallichii, Strelitzia regina, and varieties of Narcissus, Cypripedium, Bilbergia, Neottia, Epacris, Correa, &c. contributed largely to the attraction. Specimens of Tallies in Brown Stone Ware, moulded with numbers, &c. on them, were on the tables, the durability and low price of which rendered them well worthy of notice. A new part of the Transactions of the Society was distributed to the Members.

IV.—MONTHLY HORTICULTURAL CALENDAR,

FOR MARCH.

FRUIT DEPARTMENT.

Protect Wall-Trees in Blossom from frost, as Peaches, Nectarines, and Apricots. This may be done best by canvass or woollen-netting, which may remain suspended before the trees until the fruit is well set; but if this cannot be conveniently obtained, mats or other covering will do. It will however, be ne essary, if mats are used, to roll them up, and expose the trees in fine days, or the blossom will set weakly, and the crop be endangered.

Grafting may now be performed in general, on Apples, Pears, Plums, Cherries, &c, &c.

Raspberries.—If new plantations are wanted, and were not planted last month, the sooner they are done the better.

Peach-Houses will now require constant attention. When the fruit is set, and swelling up, syringe the trees, and steam every day. Admit plenty of air when the weather will permit, and keep the temperature from 65 to 75 by day, and 60 to 65 by night.

Cherry-Houses started in the beginning of January will now be in blossom. Give air night and day, examine the opening leaves, and syringe the trees well when the fruit sets, to wash off all the dead flowers, and keep the internal air very moist.

Vineries.—As the grapes swe'l, thin them out properly, and tie up the shoulders of the bunches to give the fruit room to swell to perfection. Continue to syringe and steam occasionally till the fruit begins to ripen; keep the young branches carefully tied up; stop all laterals at one joint, and all other shoots at two joints above the fruit, except those intended for leaders. Vines in Pots now brought into the Vinery will ripen fruit in July.

FLOWER DEPARTMENT.

Dahlia Roots should now be potted or plunged in a little old tan in the stove, or a frame, to forward them for planting out at the end of May.

Mignonette and Ten Weeks' Stock.—Those sown last month must have as much exposure to the air as the weather will allow, and superfluous plants thinned out of the former to about twelve in a pot, and the latter about six.

Auriculas will now begin to show their flower buds. Let them have plenty of air during the day, but shut them closely down at night, and top-dress. See p. 96.

Polyanthus Seed, if not sown last month, should be done as early in this as possible, and the old plants top-dressed, as recommended last month.

Ranunculuses should be planted early in the month.

Carnations.—About the end of the month, plant the last year's layers into large pots to bloom.

Tygridia Pavonia.—Sow the seed at the end of the month, in pots or boxes. Also the old bulbs may be planted in warm situations at the end of the month, if the weather is fine.

Tulips will now be up, examine them to see if any are cankered.

Pelargonium Cuttings should now be put in.

Hardy Annuals.—If the weather be fine, commence sowing for the general blow, at the end of the month; but if the weather is cold or wet, defer it until April.

Tender Annuals.—Commence sowing in pots, and place them in a frame on a slight hot-bed, or on the flues of the vinery.

Forcing.—Continue to take into the stove, Roses, Pinks, Carnations, &c. for the final bloom, previous to the succession in the open air.

VEGETABLE DEPARTMENT.

Peas, of all kinds, may now be sown at different times; that the crops may succeed each other. As soon as the last appears above ground, sow again. Those sown in boxes last month, should be planted out in the beginning of this, if the weather is favourable, in a warm situation, for a first crop.

Beans.—Plant full crops of Long-pods, Windsors, &c. twice during the month; also, plant in a warm situation, those sown in boxes last month, for the first crop.

Carrots.—Orange and Altringham Carrots, should now be sown for the main crop. They thrive best in a deep rich light earth; the best way of sowing them, is in shallow drills about nine inches apart.

Parsnips for the main crop, should now be sown in the same way as recommended for Carrots.

Cabbage, &c.—Plant out from the winter beds, all the strong Cabbage plants, to come into use in July; and sow the seed of the Early York, and Van Ack, &c. to come in for autumn. Red Cabbage plants should now be planted out, if not done before; and seed sown in the beginning of the month, for autumn and winter use. Sow a pretty good supply of Savoy, Brocole, &c. about the latter end of the month, for use in winter and spring.

Cauliflower Plants, wintered in frames, should be planted out on the quarters intended for them, at about the distance of two feet six inches apart. And not later than the middle of the month, sow some seed for a crop to succeed those sown last month.

Celery sown last month, if large enough, prick ont towards the end of this month on a bed of rich soil, or on a slight hotbed; and sow more seed in a warm situation.

Lettuce Plants that have been sheltered in frames, should now be planted out about a foot apart, and seed of the different kinds sown twice during the month.

Radishes.—In the beginning of the month sow full crops of the Scarlet, Short-Top, &c. and about the middle or latter end, a few White and Red Turnip Radishes.

Parsley.—Sow about the end of the month, for the principal supply, chiefly in drills.

Scorzonera, Salsafy, &c.—Sow in shallow drills about ten inches apart, towards the latter end of the month, for the main crop.

Leeks.—Sow a good crop in the beginning of the month.

Onions.—Sow the main crop early in this month, if not done in the last. See p. 96.

Potatoes.—Begin about the middle of the month to plant out the principal early crops.

Sweet Basil and Sweet Marjoram should now be sown on a slight hotbed, or on a bed of rich light earth, in a warm situation.

Mustard and Cress.—Continue to sow in boxes, &c. as recommended last month, and towards the end sow in a warm situation out of doors.

Jerusalem Artichokes.—Make new plantations of them in suitable situations, if not done before.

Turnips.—Sow a few Early Dutch, about the 20th of the month, and a larger quantity at the end, to succeed them.

Beet.—Sow the main crop of the Red, for its Roots; and a small quantity of White and Green for the leaves.

Kidney-Beans.—Continue to sow for forcing, as recommended last month.

Artichokes.—Give the proper spring-dressing towards the end of the month, and dig and level the ground between the plants.

Asparagus, for forcing, continue to plant for the final crop. About the end of the month, fork and spring-dress the productive beds. This too, is the best time for planting new beds: select a piece of good mellow ground for the purpose, dung it well, and trench it to the depth of eighteen inches or two feet; then form beds of four feet and a half wide, and make in them four narrow trenches or drills, six inches deep, and lengthways of the bed, with a spade, which will leave one side of the trench or drill upright; against this upright side insert one-year-old plants, eight inches apart, and so deep that the crown of the root will be about two inches below the surface of the bed; cover in each drill carefully, and then rake the bed slightly over to level it. If a light crop of Onions were sown on the beds the first year, they would not injure the Asparagus plants.

Strawberry Beds should now have their spring-dressing, and if new plantations are wanted, this is the best time to make them,—take off the strongest runners nearest the parent, and plant them on the beds or borders prepared for the purpose, in rows about twelve inches apart, and six inches from plant to plant in the rows.

Mint.—New beds may be planted by drawing up the young spring shoots for the purpose, and planting them in beds six inches apart.

Garlic and Shallots should be planted in the beginning of the month, in drills six inches apart, and about two inches deep.

Broccoli.—Sow Grange's Early White, for use in August. Impregnated Early White and Early Sprouting, for use from October to Christmas; and at the end of the month, the Large Purple-headed, Sulphur-coloured, Spring-White, and Late Dwarf Purple, for use in March and April next year.

THOMAS HARDCASTLE, PRINTER, CHURCH-STREET, SHEFFIELD.

THE

HORTICULTURAL REGISTER,

APRIL 1ST, 1834.

PART I.

ORIGINAL COMMUNICATIONS.

HORTICULTURE.

ARTICLE I.—ON CHEMISTRY,

AS CONNECTED WITH THE DEVELOPEMENT AND GROWTH OF PLANTS.

By the Author of the Domestic Gardeners' Manual.

THIRD ARTICLE.

Atmospheric Air.—WHEREVER we turn our eyes, to whatever natural phenomena we direct our attention, wonders present themselves, stupendous combinations overwhelm the mind with astonishment, and "give us pause."

In my last chemical paper, I endeavoured to attract the readers' curiosity, and fix it upon an inquiry into the nature and properties of *water.** The order in which the natural agents arrange themselves, leads us now to the immediate consideration of the *Atmosphere,* that elastic, invisible fluid, which, though its effects upon vegetables may not be so palpable as are those of the *liquid* element, must be as vitally influential of the due and healthy performance of

* The Reader is requested to correct the Errors of the Press which occur in that Paper, page 3, of the present Volume.

Page 4, line 14, for "repeal" read "reveal."

Page 9, line 2, for "speces" read "species."

Page 10, line 13, for "germ" read "form."

Do. last line but two, for "concern" read "concerns" and place a comma (,) after the word "effects,".

their several functions, as it manifestly is indispensable to the very existence of the animal creation. But what is *Air?* is it, in fact,—as was sacredly believed at no very remote period, a simple element, one of "the four," or is it not?

Let us have recourse to experiment—and in the first place, let us pay the just tribute of respect due to the great Lavoisier, and adduce his important, his conclusive discovery.

As it will be impossible to present a drawing of the apparatus employed by the operator, I must be content to state the materials employed, and the final results, in general terms, referring the reader to Vol. 1, pages 82 and 3, of the fifth edition of the "*Elements of Chemistry.*" Four ounces of quicksilver were introduced into a glass-matrass or retort, the beak of which passed through a body of the same fluid metal, into a bell-glass receiver. These two vessels contained about fifty cubical inches of atmospheric air. "Having accurately noted the height of the thermometer and barometer," (I quoted the exact words) "I lighted a fire in the furnace" (upon this furnace the retort was placed, and reference is here given to an engraving,) "which I kept up almost continually during twelve days, so as to keep the quicksilver always very near its boiling point. Nothing remarkable took place during the first day: the mercury, though not boiling was continually evaporating, and covered the interior surface of the vessel with small drops, which gradually augmenting to a sufficient size, fell back into the mass at the bottom of the vessel. On the second day, *small red particles* began to appear on the surface of the mercury; these, during the four or five following days, gradually increased in size and number, after which they ceased to increase in either respect. At the end of twelve days, seeing the calcination of the mercury did not at all increase, I extinguished the fire, and allowed the vessels to cool." The bulk of air in the body and neck of the matrass, and in the bell-glass, at the same medium height of the barometer and thermometer as at the commencement of the experiment, was reduced from fifty cubical inches to something between forty-two and forty-three cubical inches; "consequently it had lost about one-sixth of its bulk. Afterwards, having collected all the red particles from the running mercury in which they floated, I found these to amount to forty-five grains."

This experiment was several times repeated to attain assured accuracy; this being effected, "the air," he adds, "which remained after the calcination of the mercury in this experiment, and which was reduced to five-sixths of its former bulk, was no longer fit either for respiration or for combustion: animals being introduced into it

were *suffocated in a few seconds*, and when a taper was plunged into it, it *was extinguished* as if it had been immersed in water."

This is no fanciful experiment, it is not one of mere science, performed by a gentleman in his private laboratory. With some modifications it is, and has long been, repeated by the operative chemist, for the production of one of the most energetic preparations of mercury, add (the *red oxide*, or *Mercurius calcinatus.*) The late Sir H. Davy states in few words that follow the converse of the experiment just adduced.

"To procure pure oxygen from air, quicksilver may be kept heated in it, at about 600 degrees till it becomes a red powder: this powder when ignited, will be restored to the state of quicksilver by giving off oxygen."—*Agricul. Sects. p.* 194. *Edit.* 4.

That the reader may acquire some idea of the chemical changes effected by these processes, I add the mercury in the vessel, subjected for many days to a high temperature, is acted upon by a portion of the atmospheric air within the vessel. It gradually loses its metallic appearance, and certain portions of it acquire a red colour and crystalline figure. These red particles are heavier than the portion of mercury which has disappeared; for if the remaining metal, and the red particles be weighed, they will be found to exceed in weight that of the mercury originally employed; and if the air remaining in the vessels be also correctly weighed, it will be found to have lost in weight exactly as much as the red particles of the preparation have acquired.

These red particles (as Davy asserted, and Lavoisier's experiment had in its completion clearly demonstrated,) will give forth by the agency of heat, that portion of the air, which they had attracted. The air of the atmosphere is thus proved to be composed of two æriform fluids or gases at the least; and by a variety of well conducted experiments, chemists have arrived at the conclusion that, the non-respirable part exists in the proportion of about 79 in every 100 parts of air. The remaining 21 parts consist of a gas which is not only respirable, but capable of supporting combustion in a very eminent degree. In my first paper, page 436-7, I alluded to both these gases; to the former under the terms of Azot or Nitrogen, and to the latter, under that of oxygen.

How the agency of fire may be exerted so as to cause, first, the attraction and fixation of the oxygen, or vital principle of the air; and second, its separation and expulsion from the red oxide, the formation of which it had previously induced, is one of those mighty secrets, which the human mind may, perhaps, never be permitted to

fathom. Nature affords irrefragable evidence of the all prevailing, all actuating principle of elementary fire, a principle that can alone be rationally referred to the Sun. I cannot, however, dwell now upon any inquiry into the facts that give substance to the hypothesis which, I fear has been of late, but too little investigated. The subject will be resumed when I come to consider the phenomena of light, heat, and electricity. As few readers can be supposed to possess an apparatus, by which they may bring the foregoing experiments to the test, I shall mention another, far more simple and of easy performance, that may afford some ready proof of the compound, decomposable, nature of atmospheric air.

Pour a quantity of water into a flat dish, let a small saucer containing a little lamp oil, and a cotton wick be made to float on the water; by the side of the saucer fix a stand of any sort that can support a piece of wax taper, so that its wick may rise two or three inches above that of the lamp, then adapt a tall bell-glass to the dish, large enough to permit it to cover the saucer and taper, and to leave a space of an inch or more between them and the glass. The height of the bell ought to be such as to leave six inches clear space above the taller wick. The apparatus being thus prepared, light the two wicks, cut each of them, if needful, till the flames appear well defined and without smoke, and then invert the bell-glass over both. Its lower edge will now be immersed in the water of the dish, and thus, air will be entirely excluded. For a time, each will emit its usual light, and at first will produce expansion of the air within, so that the operator ought to press gently, but steadily, upon the top of the glass to keep it from falling, with his hand guarded by a cloth, to prevent accident in case of a sudden fracture. By the attractive energy exerted between the combustible bodies, and the supporting principle of the air, (the oxygen gas,) all, or the greater part of the latter will be separated from the other component gas, and unite with the components of the cotton, oil, and wax. Water and some carbonic acid will be formed; the former will be deposited chiefly in the dish, and the latter will also, in part, combine with the water, as that fluid and carbonic acid have some affinity for each other. In proportion as the supporting principle is withdrawn, the flames of the wicks will grow smaller, but that of the taper will, in most instances, be first extinguished, owing to the superior weight of the purer air. As, however, carbonic acid is still heavier, the quantity produced by the taper may perhaps descend, and put out the flame of the lamp. When both have expired, it will be evident that, the air remaining in the bell-glass can no longer be capable of supporting combustion;

it therefore has been deprived of one of the essential qualities of pure atmospheric air; and that it has been so deprived, will be ascertained by another concomitant proof; for there will be an absorption of water as soon as the air within shall become somewhat cool. In other words, the external air, pressing by its incumbent weight upon the surface of the water in the dish, will force a portion of it into the bell-glass; and as therein, it will meet with diminished resistance, owing to the abstraction of the oxygen, the water will make its mark at a level above the one at which it stood at the commencement of the experiment. If both their levels were marked, and the total capacity of the bell-glass ascertained by filling it with water, a comparison might easily be made between the total bulk, and that of the air consumed. In experiments of the above nature, great accuracy, however, must not be expected, but, they suffice to evince that a considerable portion of the air has been abstracted. The Azot remaining, could not be breathed; it would be fatal to any small animal. Its nature, however, has for the present been sufficiently described; and with respect to the oxygen, I refer the horticultural reader to an experiment for its production more pleasing and germain to his profession, which he will find by reperusing the three first paragraphs in page 8, of the article upon water.

I shall have occasion to revert to this experiment again, as involving phenomena connected with the agency of solar light.

Azot is lighter than atmospheric air, and still more so than oxygen gas.

The specific gravity of the last is about 1,1. That of azot about ,983 decimal parts, taking atmospheric air as the standard of unity, or at 1,000. One hundred cubical inches of azotic gas, according to Henry's table, weigh about 30,5 grains (30½).

The foregoing chemical facts are not new; they are, or may be, familiarly known to every practical and reading chemist; I therefore lay claim to nothing approaching to discovery in all that I have as yet adverted to. But I do not write for chemists; my object is to introduce the young gardener to the knowledge of a few leading principles, and thereby to rouse a spirit of inquiry, a love of reading, and above all, a determination to reason, reflect, and draw conclusions by his own mental powers, uninfluenced by servile deference to the dicta of authority.

Chemists are nearly agreed in the proportions they assign to the two essential components of air, *Azot and Oxygen;* but they are at variance in respect to the volume of other fluids which are found to exist in it. Carbonic acid is one of these fluids, and it is estimated

by Davy that, in places where there is a free circulation of air, it is probably never more than $\frac{1}{600}$ nor less than $\frac{1}{800}$ of the volume of the air."

Upon the composition of this gas, formerly known by the terms *aërial acid*, and fixed air, he observes, that if thirteen grains of well burnt charcoal be inflamed by a burning-glass, in one hundred cubical inches of oxygen gas, the charcoal will entirely disappear; and provided the experiment be correctly made, all the oxygen except a few cubical inches, will be found converted into carbonic acid; and, what is very remarkable, the volume of gas is not changed. On this last circumstance, it is easy to found a correct estimation of the quantity of pure charcoal and oxygen in carbonic acid gas: the weight of one hundred cubical inches, is to that of one hundred cubical inches of oxygen gas as forty-seven to thirty-four; so that forty-seven parts in weight of carbonic acid gas must be composed of thirty-four parts of oxygen, and thirteen of charcoal." (See 5th Agricultural Lecture.) Now by Henry's table, upon the authority of Kirwan, one hundred cubical inches of oxygen gas weigh thirty-four grains: hence, if the one hundred inches be attracted during the combustion of thirteen grains of charcoal, and united therewith, the result must be about forty-seven grains of carbonic acid gas, and this was the fact to be demonstrated. Carbonic acid derives its name from the latin word *Carbo,* (see Vol. 2, page 437,) and from the combination of that base, with the supposed *acid,* producing agent, oxygen (ib. page 436.) It is soluble in water to perhaps, the extent of rather more than the bulk of that liquid to which it then communicates acid qualities. In its free state, it exists in the form of gas; but it is attracted, and fixed in the solid form, by many chemical bases, by lime particularly, which it renders mild. This mild lime is chalk, chemically termed *carbonate of lime:* the facts connected with carbonic acid as a vegetable aliment, will come under notice in a future article.

Another substance is traceable in atmospheric air, as one of its apparent components; though chemists generally consider Azot and Oxygen to be the sole essential constituents of true respirable air. Water is stated to exist in the form of vapour at all times, but in varying proportions, according to the temperature of the atmospheric volume.

I have spoken at some length upon the chemical nature of water in my second article, but much remains to be said when that fluid is viewed in connection with the constitution of atmospheric air; and I request the reader to bend all his attention to the following

facts, for they are of stupendous moment. There are, as might be expected, a great variety of opinions concerning the comparative quantity of watery vapour in the atmosphere: at fifty degrees, Davy states it to be about $\frac{1}{50}$ of the bulk of the whole, but as the specific gravity of vapour is to that of air as ten is to fifteen, the weight of vapour is only $\frac{1}{75th}$ part. The average temperature of day and night throughout the year, may perhaps somewhat exceed fifty degrees; therefore, if we admit that a greater volume of vapour is raised during a warm state of the atmosphere than when the temperature is low, we may suppose that the quantity exceeds, upon an average, that above noted. Some, however, have considered one part in one hundred to be a fair estimate of the amount of vapour held in solution, or that it varies from $\frac{1}{80th}$ to $\frac{1}{100th}$ part.

The subject involves phenomena of far greater moment: it points to the origin and source of the atmosphere itself. Whence was the aërial volume derived, and what supports and renews it? for the consumption or degradation of the fluid by the processes of animal respiration, and natural fermentation are of enormous extent!

Dr. Priestley and Sir Humphrey Davy, at periods very remote in point of time, witnessed phenomena in regard to azot nitrogen, which gave reason to suppose that, that gas was not simple, or uncompounded in its nature. The latter chemist conjectured in fact, that he had decomposed it, and that it might be an oxide of hydrogen.

I stated, several years past, that I believed this to be the fact; and I then embodied my ideas in the form of the following atmospheric theory.

"The atmosphere was originally formed out of, and is daily renewed by vapours raised from the surface of the earth and waters, by the agency of solar induction and decomposition; that it is therefore, composed of the elements of water in a new and peculiar arrangement, effected by the energy of specific electro-chemical agencies."

I believe that the idea of the aqueous origin of air was once entertained; but that it was relinquished as untenable, or silently abandoned—to use a familiar phrase—as out of fashion. I claim as my own exclusive hypothesis, that of the inductive agency of light in this vast process; and I therefore am called upon to state the evidences upon which I ground my opinion.

The first is afforded by the phenomenon of evaporation. The experiments of Dr. Halley, the celebrated astronomer, led him to the calculation, that as one cubic inch evaporated from every ten square

inches of the surface of the sea in twenty-four hours, a square mile of surface would evaporate daily 6914 tons. The Mediterranean sea was supposed to lose, each day, 5280 millions of tons; and Dr. Thompson was led to infer, that the average volume of water raised from the whole surface of the earth, amounts annually to ninety-four thousand, four hundred and fifty cubic miles.

Now all this may be very wild and visionary, but the learned Bishop of Llandaff, Dr. Watson, founded his calculations upon more familiar experiments, and he thence arrived at the conclusions which I proceed to state. He placed glass vessels of known capacity upon the surface of the ground, when that was in very different states of dryness; and found that even in periods of drought, under a burning sun, the quantity of vapour yielded was prodigious. He estimated the quantity of pure water yielded by a single meadow of an acre's surface in twenty-four hours, to be equal to 1600 gallons.

Two-thirds of this inconceivable volume of water, which, be it recollected, if reduced to a state of vapour, must occupy fully 1400 times the original bulk of the liquid—two-thirds of this volume are supposed to be precipitated in the form of rain. A portion also may be condensed as dew, but what becomes of the remainder of the vaporised water? I suggest the reply, fearless of any conclusively philosophical refutation, that it is converted by solar electric agency into the pure respirable air of the atmosphere, whose volume it thus replenishes and maintains in its integrity.

To corroborate this hypothesis, which by most, may perhaps be denounced as fanciful, and utterly devoid of foundation, I appeal to the following phenomena.

1. *Phenomena of Vapour and Steam.*

The production of vapour is now admitted to be attended with electricity; it is in fact, a process of developement by the agency of heat, or combustion, whereby the particles of water are separated, and kept apart, by a repulsive power. If steam be projected into the air from a boiling vessel, or even from the lungs, by forcible expiration, it assumes various forms, according to the existing state of the atmosphere. If that be cold and damp, the vapour remains distinctly visible for some seconds; yet even in such a state, when also, the concomitant of a fog or mist affords proof of the abundance of atmospheric humidity, the steam rolls about, disperses, and is lost, amidst the accumulated vapour. If, on the contrary, the atmosphere be dry, and buoyant, (be the temperature what it may,) the steam rises, expands, breaks off, into light, irregular masses, and speedily disappears. Every action, every form it assumes, denotes repulsion

and attenuation, not combination, nor attraction. The vapour is taken up into the mass of clear air, and becomes an integraut part of it.

The same thing occurs, though upon a grander scale, with those stratified mists, which, in summer and autumn, afford proof of, and precede, a clear and settled state of weather. The morning which comes attended with one vast and dense haze, is gradually relieved by the agency of solar light; the vapours break, form into masses, and roll away, till they vanish into air, and leave the sky cloudless, and under the dominion of a powerful and burning sun. The same vapour under a different modification, is frequently the precursor of a thunderstorm. Instead of vanishing, it is formed into vast cumuli, which, bearing different electric relations with other cumuli, or with a portion of the earth's surface, emit when within the sphere of mutual attraction, flashes of fire, and effect the decomposition, and in the next instant, the re-formation of the watery particles. The reader who has witnessed the striking effect produced by throwing a certain portion of water upon a large mass of burning coals, ignited to almost a white heat, may readily imagine a case of the sudden developement of the constituents, (oxygen and hydrogen gases,) and at their instant re-union, attended with a most tremendous explosion. The phenomenon is not far remote from the one under consideration.

I proceed to notice other natural facts which tend to prove the conversion of vapour into atmospheric air, these are to be found

2. In *the Phenomena of Hoar-Frost and Snow.*

Whoever is attached to meterological observation, can scarcely fail to recollect the singular disappearance of those concomitants of winter. A mist or stratus, at times accompanies severe frost; in this case, the whole surface of the ground, every blade of grass, every twig, is covered with frosts speculæ: a tree, a mass of trees particularly, presents a splendid spectacle, every portion of the spray is studded with crystals of dazzling whiteness. Under these circumstances, the hazy mist alone being removed—in a state of perfect calm, without any particular change in the temperature, without thawing, or any visible solution of the particles, the whole of the rime shall disappear, vanish, and be taken up by the air. A body of snow also, is frequently seen to dwindle away without any abatement of frost, or dispersion by the force of wind.

During the operation of these silent attractions, millions of cubic feet of crystallised water (such at least, these meteors are believed to be) are taken up into the aërial volume, and wholly disappear! In some instances, these phenomena are followed by rain, and then, it

is reasonably supposed that, the vapours thus assumed, are not decomposed; but in other instances, the atmosphere brightens, the barometer rises, and the weather becomes settled. This state of things leads to the consideration of

3. *The Phenomena of Atmospheric pressure.*

But here I must conclude, for I have so far extended my limits that, I postpone the consideration of the interesting facts which remain to be adduced, till I again address your readers in my fourth chemical article.

January 11*th*, 1834.

ARTICLE II.—PROTECTING WALL-TREES.

BY J. A.

THE following method, communicated by a friend of mine, appears likely to effect the object he has in view. I only regret the idea was not furnished a post or two earlier, for insertion in your March number, as the very early developement of blossom this season will render every precaution for its protection necessary. Procure a net of light material, and about three inches in the mesh, sufficiently large to cover the whole front of the tree; and having well strewed the floor of some still place with feathers, those of game or pigeons, which are generally destroyed, would be excellent, pass a stout pack thread all round through the outside meshes of your net, and with an assistant at each corner, immerse it in a kettle of boiling pitch, and when properly soaked and still hot, let each one step quickly to his appointed corner, and simultaneously drop the net upon the feathers, which will be taken up. The net so fledged may be immediately suspended where its services are desirable, by any method the operator chooses.

The experiment not having had a season's trial, the distance must also be left to the choice of those who are pleased to adopt the plan.

Tazely, February 26*th*, 1834.

P. S. Wool, hair, or down, might be substituted, but perhaps without much advantage.

ARTICLE III.

TREES,—CHAUCER AND SPENCER.

BY VIOLA.

I HAVE already stated, that in consequence of the increasing taste for literature, it appeared to me desirable, that all publications which are devoted to the instruction and entertainment of individuals, who cultivate those noble and beautiful children of the earth, trees, and flowers, should occasionally contain a paper, which without being either irrelevant, or a mere detail of cultivation, might bear upon the charming and innocent occupation to which they devote their lines; and perhaps would not be unacceptable to the juvenile reader: I have therefore undertaken to pioneer the way for more able writers.

The more a man finds to admire in his pursuit, the greater will his attachment to it become: the more he sees that the great, and wise, and good, have prized the lovely objects of his care,—the higher will be his respect for them, for his own taste, and for himself. Heaven forbid that any one should infer, that because fortune may have placed us in a humble sphere of life, we should be necessarily low-minded: proofs are every day crowding forward to convince us of the contrary. A few individuals are occasionally found, of envious, vulgar, presuming minds, who, because they differ from their brethren of the spade,—express themselves in abusive terms, instead of using gentle and courteous language: and these persons are too often mean enough to shield themselves, under a feigned cognomen, from the contempt they dare not encounter, in their real names.

When we see the scribblings of such persons admitted into meritorious periodicals, we grieve and are ashamed. To foster a bitter spirit, and bad taste, is a weakness, an oversight, a fault in the conductor of the work, which we pity while we blame.

In the *Register*, we never meet with them; it is distinguished for the gentlemanlike manner of its discussions; and good feeling is never insulted in its pages.

A work on Horticulture, is not intended for the envious and low-minded only,—it is perused with avidity by the noble, the fair, the gentle, and the scientific; and why should these be annoyed with vain and idle wranglings? The time is fast wearing away for such a taste to exist even among those who have been styled in contempt, "the dregs of the people."

The mass has been powerfully shaken, and the lower part of it is mingled with the choice portion—the middle of the vintage. No proof more convincing of this need be required nor adduced, than the difference that exists between the solid literary food daily prepared for the nourishment of the labouring classes; and that frothy trash which is tricked out, and dished up to tempt the jaded appetites of the "higher orders." I need but instance such publications as *Chambers's Journal*, the *Penny Magazine*, *&c.* for the use of the former;—and contrast them with the splendid—bound frippery that reposes on the magnificent furniture of aristocratic drawing-rooms.

Fashionable tales always appear to me to be the joint productions of upholsterers, man-milliners, and ladies' maids.

But to the subject of this little paper. Flowers and poetry are intimately associated; indeed the very essence of poetry has been extracted from those lovely productions of nature. But these shall form the subject of a future paper, if you think well of my plan. At present, I would bring to the notice of those of your readers, who may not be familiar with our two earlier master poets, Chaucer and Spencer,—a passage from each, in which trees are concisely and beautifully described. Their quaintness of style and obsolete spelling are frequently given as a reason for not reading those glorious old authors; I have therefore modernized the extracts to the best of my ability; but by so doing, I destroy the metre of the poetry, and injure the "handling" of the subject.

Chaucer is supposed to be conducted into a grove, where he beheld trees of goodly growth and beauty: and thus in two words he describes the character and uses of each species. I so much prefer the original—

"The gold dewe drops of speche and eloquence."

that I am tempted to place it by the side of the *interpretation*, for comparison:—it is so natural to suppose, all must partake of our own feelings, on a favourite subject!

"The bildin oke, and eke the hardie ashe,
The pillir elme—the cossin unto caraine,
The boxe pipetre, the holme to whippis lassche,
The sailing firre, the cypress, deth to plaine,
The shotir ewe, the aspe for shef tis plaine,
The olive of pece, and eke the droukin vine,
The victor palme, the laurir to divine." *

* Chaucer's Assemble of Foules, (Assembly of Birds.)

"The builder oak, and also the hardy ash,
The pillar elm—coffin for the dead,
The box pipe-tree,* helm (ilex) for whips' lash,
The sailing fir,† the cypress, used in mourning for the dead.
The shooter yew, the aspen for smooth arrows,
The olive of peace, and also the drunken vine,
The victor palm, the laurel to divine."

In the first book, and first canto of Spencer's *Faery Queene*, the following charming lines occur. A "guille Knight, and lovelie ladie, are riding through a grove." The reader will see how closely Spencer has followed his great predecessor, and how little his lengthened expletives add to the concise language of "Dan Chaucer."

"And forth they passe, with pleasure forward led,
Joying to heare the birdes sweete harmony
Which therein shrouded from the tempest dred,
Seemed in their song to scorne the cruel sky.
Much can they praise the trees, so straight and hy
The sayling pine, the cedar proud and tall,
The vine prop elm, the poplar never dry,
The builder oake, sole King of forests all,
The aspine good for staves, the cypresse funerall.

The laurell mede of mightie conquerours,
And poets sage, the firre that weepeth still,
The willow, worne of forlorne paramours,
The eugh obedient to the bender's will,
Birch for shaftes, the sallow for the mill,
The mirrpe sweete bleeding in the bitter wound,
The warlike beech, the ashe for nothing ill,
The fruitfull olive and the platane round,
The carver holme, the maple seldom inward sound."

The above quotations I have selected, rather for their appropriateness to your publication, than with a view to their poetical beauty, which in fact is only apparent in the terseness of the language, and faithfulness to the characteristics of the several trees.

It is pleasant, however, to compare their uses, in by-gone days, with those to which we still apply them.

How comprehensive is the term "builder oak," used by both our poets "sailing pine," then, as now, destined to urge our navies through the "breasting surge."

* *Pipes* were formerly, and *Flutes* at present are made of this wood.
† Masts.

The "shooter yew," a simple word, that carries our imaginations back to the battles of Crecy, and Poitiers, where the prowess of our archer ancestors, was celebrated by the historian Froissart, whose chronicles are as entertaining as a romance.

How wonderful is a judicious adaptation of terms,—how charming is poetry,—how extraordinary the skill of the poet, to produce a picture to the "mind's eye,"—in a single phrase, which would tax, for many weeks the labour and invention of the ablest painter to embody!

The "drunken vine!"—"Bacchus and his pards,"—and "goat foot shapes," and ivy crowns, and heaped up bunches of rich purple grapes,—and all the merry rout, that startled Ariadne in her lonely isle,—and Old Silenus, "tipsily quaffing,"——all these, and many, many more beautiful visions, of the ancient mythology, crowded into our imaginations, touched into life by the magic of a poet's wand.

I am an enthusiastic admirer of trees; and cordially agree with the picturesque Gilpin, who thus commences his charming work on "Forest Scenery." "It is no exaggerated praise, to call a tree the grandest and most beautiful of all the productions of the earth."

Gilpin was a painter, and his work was written with reference chiefly to the situations of his favourites, in a pictorial view. Thus we have poets, painters, authors, drawing our attention to a subject replete with interest; and particularly delightful to young and sensitive minds. Can I do wrong, Sir, to point out to such, the several springs at which they may slake their thirst for knowledge, conveyed through the medium of charming language?

Chaucer—alas!—is to many, a sealed book:—the causes are, the quaintness of his style, together with occasional freedom of handling his subject, which, although perused and admired by the good, the fair, and the noble of his own day, will not suit the refinement of modern times. These objections have been lately entirely obviated however, by a very elegant little publication of a part of his works, called "Tales from Chaucer," in prose, which all should read who wish to commence an acquaintance with him, of whom Spencer says, he was

"A well of English, undefiled:"—

And a more recent author,--Akenside, writes

"Him who in times
"Dark and untaught, began with charming verse
"To tame the rudeness of his native land."

I would not trespass, Sir, either on your space or the attention of your juvenile readers; and therefore close my paper with a sincere

wish, that the beautiful subject which I have attempted to introduce had fallen into abler hands. No one is more desirous, though many are more capable to persuade the rising generation to cultivate the beauties of nature, and a taste for the early poetry of England, with their inseparable concomitants—piety, gentleness, and "good-will towards men."

ARTICLE IV.

THE FOSSIL FLORA OF GREAT BRITAIN,

Or Figures and Descriptions of the Vegetable Remains found in a Fossil State in this Country.

BY JOHN LINDLEY, F. R. S, &c. AND WILLIAM HUTTON, F. G. S, &c.

Quarterly Numbers, Price 5s. 6d.

It is some time since two numbers of this work reached us, and we very much regret having so long omitted to notice their contents. It is our candid opinion, however, after a careful inspection, that the work is one of much merit. Nor shall we be accused of flattery, when we say that no persons in this country are more capable of doing justice to the subjects than the two authors engaged upon it. Their plan and object, and their schemes for accomplishing the one and effecting the other are certainly deserving of the highest commendation. The various vegetable productions here brought together and figured, lead back the mind to days long since passed away, when, although now found at a great depth in the earth, they grew and flourished on the surface of our world, like the vegetables of the present day. The Authors remark, in No. 10, which appeared last October, "it was a part of the plan laid down when we commenced this work, to take the opportunity afforded by the appearance of each succeeding volume, to state such general opinions as we might be led to entertain on the subjects embraced; accordingly, it is our intention at the present time to detail some views we have been induced to take of the circumstances under which the vegetable fossils of the Carboniferous formation have been deposited and mineralized, together with a general sketch of the rocks comprised in the term "Coal Measures;" in the structure and composition of which, vegetable remains form so important a part, as to give an economical value to them far surpassing any other. In doing this, we beg it may be held in view by our readers, that our references will be made exclusively to the great Coal field of the North of England. We have

several reasons for limiting ourselves, in the present article, to this district; the first is, it has been far more extensively worked, and its productions are, consequently, better known than any other. It has, also, furnished us with a very large portion of the materials we have hitherto made use of; and the residence of one of the Authors in the midst of it, has necessarily brought the circumstances attending it more particularly under our notice. There is a convenience, also, in thus limiting our references, as our observations cannot occupy a large space; besides which, we are convinced, that, in every essential circumstance, the history of one series of Coal measures is the history of every other of the same age.

It was our wish to have appended to this a Catalogue of all the vegetable fossils hitherto discovered in it; but, in attempting to form one, we have immersed ourselves in a labyrinth of difficulties, one half of its fossils having never been described; and, although we could easily ally a portion of these to known genera, yet the greater number of them would remain absolute riddles---waiting for some fortunate discovery by which they are to be connected with fossils already known, or proved to belong to others yet to be discovered.

The beds usually denominated the Coal measures, being the higher part of the Carboniferous formation, occupy a large portion of the Counties of Northumberland and Durham, reposing upon, and being conformable to, the inferior members of the series. They consist of irregularly alternating beds of sandstone, shale, or argillaceous schist, and coal, whose aggregate thickness may be estimated at 300 fathoms. This may not be correct, but is, probably, near enough the truth for our purpose.

With the exception of the coal itself, and a few layers and nodules of clay-iron-stone, embedded in some of the shales, the whole of these beds are of mechanical origin, the shale being evidently laminated clay, or mud, consolidated by pressure; and the sandstones abraded Quartz, Felspar, and Mica, agglutinated by an argillaceous or calcareous cement. From whence the immense mass of travelled matter, of which these sandstone and shale beds are composed, may have come, it is somewhat difficult to conjecture. The sandstones of the series below the Coal measures, denominated millstone grit, contain interspersed masses of water-worn quartz, of considerable size; and rarely amongst those of the Coal-formation, a bed will be found, partaking of the same characters; but the mass consists of minute siliceous grains, which are not rounded, or but partly so; from which it is fair to infer, that, whatever were its origin, the sand of which they are composed was not brought from any great distance,

or formed like the sands of our sea shore, by the slow action of attrition upon rocks previously consolidated, but that it had, probably, been produced by the ruin of crystalline rocks, so slightly coherent, as to have been unable to withstand the violent action of water, to which they had been exposed. The sandstones are all, more or less, micaceous, some of them containing that mineral in large quantity; where this is the case, and the plates are of considerable size, the stone is finely schistose. This is another proof that the materials forming the sandstone, had undergone little mechanical action previous to disposition, or the fragile mica would have disappeared.

In the series of beds, the coal itself forms, in bulk, a very inconsiderable portion of the whole. Forty seams are enumerated, but the greater part of them are too thin to be worked to profit.

The district has long been famous for producing coal of the finest quality, which has been extensively worked, and, up to the present period, the largest mining speculations in the kingdom, and, probably, in the world, are carried on within it. This being the case, it has become a matter of great economical importance, to define, as nearly as possible, each separate bed in the series, and this has been done with great minuteness. It is the universal belief of those best practically acquainted with the subject, that even the thinner beds of coal, when not cut off by the rise of the strata to the surface, or by some fault, are spread out over the whole area of the formation. Whether this be the case or not with all the seams, we shall not stop to enquire; but the two beds known as the High and Low Main Seams, from their not only being the thickest, but as affording, in their whole mass, coal of fine quality, have been worked for centuries, and are known over a space, in the first instance, of more than eighty, and in the second, of two hundred miles square.

In studying the Carboniferous formation generally, with reference to the circumstances under which its different members have been deposited, nothing is more singular than the sudden change in the nature of the beds composing it, and the clearly defined line by which these beds are separated from each other; this is most particularly striking in the lower portion, where a thick stratum of Carbonate of Lime will be seen to terminate abruptly, and be immediately succeeded by a bed of entirely mechanical origin, and of a composition so opposite, as to contain scarcely any calcareous matter whatever. Nor is the difference of the nature of the two beds more striking, than the difference of their imbedded organic remains; whilst those of the limestone are almost exclusively of marine animals, the sandstones very rarely contain fossils at all; and these,

when present, are, in a majority of cases, terrestrial vegetables.

The Carboniferous formation presents, from the lowest to the highest member, a series of the same vegetable forms. In the sandstone beds, immediately succeeding the old red Conglomerate, which occurs at the base of the formation, along the line of the great Cross fell fault, Sigillaria, Lepidodendron, Calamites, and Stigmaria, begin to make their appearance; as we ascend, the vegetable remains increase, whilst those of marine animals, which existed in the limestone and shale in profusion, decrease, until we arrive at the Coal formation proper, where marine remains disappear, giving place to those of vegetables alone.

In this part of the series, we have the remains of plants in every bed; the sandstones contain them, but, from the roughness of their mechanical composition, it is the larger and stronger stems only which have left their forms impressed upon rocks of this class. Coal itself very rarely retains any outward marks of its vegetable origin, but the shale bed, immediately over the coal, (when that substance forms the covering, as it usually does,) furnishes us with fossils in the greatest abundance. These are exposed by the operations of the miner, who, in removing the coal, often brings to light vegetable forms of singular beauty and variety, which are almost invariably found parallel to the laminæ of the stone, and pressed flat, their outward form being retained on the shale as it was taken by the soft mud which sealed them up, their substance being converted into coal. Very large stems are often found standing across the strata, and penetrating through several different beds.

The vegetable origin of coal is now universally conceded; and it is almost as universally believed, that the plants, of the remains of which it is composed, were swept by torrents from some neighbouring high and dry land, into lakes and estuaries, where, becoming saturated with moisture, and loaded with sand and mud, they sank to the bottom, and there reposed upon previously deposited beds of sand and mud; another vegetable mass being in turn washed off, and buried by successive deposits of these substances, to be followed, in due time, by another, and another.

Associated with the seams of coal, and in the beds immediately surrounding them, stems of Sigillaria, of a large size, are frequently found standing erect, with their roots proceeding from them on all sides, (see Vol. 1, plate 54.) We are aware that the evidence of plants in this position having grown on the spots where we now find their remains, is not complete if taken alone, as it has been argued they have been floated from a distance, and left standing in an up-

right position by the force of gravity, as is known occasionally to be the case during floods, where trees are removed along with the soil in which they grew; and this seems to have been certainly the case with the upright stems in the sandstone of the French mine of St. Etienne, where the different levels of their roots prove, as M. Constant Prevost has already remarked (*Dict. des Sc.* art. *Terruin*) that they could not have grown where they now stand; but in the Lias Cliffs near Whitby, where the fragile stems of Equisetum columnare occur perpendicularly, they cannot have been so placed by force of gravity; and if evidence the most conclusive be required of the fact of vegetables having sometimes been overwhelmed on the spots where they grew during the deposition of the strata, it is furnished by the Fossil Forest of what is called the "Dirt bed," immediately over the fine building stone of the Island of Portland; and sub-marine forests of the present day supply us with the same fact, connected with a different order of things.

The fossils of the Coal measures occur often in groups; thus in the roof of the coal in Felling Colliery, the remains of Pecopteris heterophylla, (see Vol. 1, plate 38,) were, a few years ago, most abundant; they occurred alone, almost unmixed with any other, over a considerable space, but, beyond that, have been rarely found, so that they are now comparatively scarce. Could such grouping have taken place if the individuals had been swept from a distance?

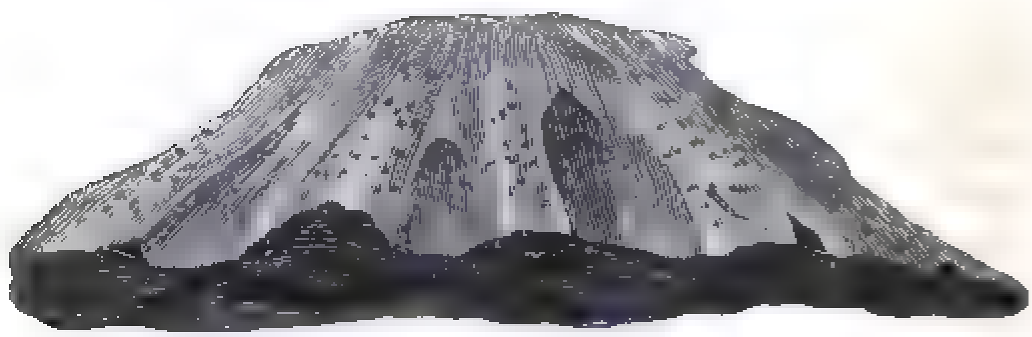
In plate 31, Vol. 1, we figured a nearly perfect specimen of Stigmaria Ficoides, which was found, with two others, almost as perfect, in the shale forming the covering of the coal, in the Bensham seam, Jarrow Colliery, at the depth of about two hundred fathoms from the surface; since that period, fourteen others have occurred, all in the same bed, and within a space of about six hundred yards square.*

Two of the specimens above alluded to, have been recently removed from the mine; one is the impression of the under side of the plant, shewing the central concavity, and fifteen arms proceeding from it, four of which are distinctly branched; they are all truncated, the longest being four feet and a half.

* That a proper idea may be formed of the abundance in which the remains of Stigmaria occur in this bed, it should be stated, that those alluded to above, have all been brought to light in a short period, by the working of the mine; and that only in the roof of the passages, as from the mode of operation rendered necessary by the nature of the bed above the coal, at the first working, two thirds of that substance is left standing for its support; when this coal is afterwards removed, the roof will fall, so that it may never be possible to ascertain how many of these fossils now remain covered up.

The other specimen, of which the following is a sketch—Fig. 15.

15



is of much smaller dimensions; and, in this case, fortunately, the fossil has detached itself from the roof, thus affording an opportunity of examining the upper surface of the central portion, which none of the before cited instances did. This exhibits the same wrinkled appearance, with indistinct circular spots, as the under side described, Vol. 1, page 104; it has nine arms, five of which sub-divide into two branches, at about eighteen inches from the centre of the fossil, and one at three feet; in this, as in the other instance, they are all broken off short. This fossil, as before observed, occurred in the bed of ~~shale~~ immediately over the coal, towards which all the branches slanted. Two of these, which were longer than the others, were seen to reach the coal, where they were lost in the mass; whether the others had done so or not, could not be ascertained.

ARTICLE V.

TO PROMOTE THE FRUITFULNESS OF PEAR-TREES.

BY MR. B. SAUNDERS, NURSERYMAN, JERSEY.

The fact that many disappointments are experienced by gardeners and amateurs, in their endeavour to procure crops of many fine sorts of pears, is well known. The practical application of the following suggestion will, however, in many instances, remove these disappointments and insure good crops.

There are many varieties of pears, which every year blossom very abundantly; and yet, to the great disappointment of the cultivator, the whole of the flowers fall off without setting a single fruit, although the soil and situation may be very congenial, and every care has been taken in planting, &c. This is the case with the Duchesse d'Angouleme, and with many others. The trees of these varieties devote the

whole of their strength and sap to the production of a superabundance of blossoms; but unless they are assisted by art, they have not sufficient strength to set their fruit. In order, then, to remedy this defect, and to assist nature as much as possible, adopt the following plan :---

Take a pair of scissors, such as are used for thinning grapes, and go over the corymbs of flowers, or rather of flower-buds, as soon as they are sufficiently elongated to allow the points of the scissors to pass between them, that is, some days before the blossoms are expanded, and thin them; leaving only five or six blossoms in each, according to the size of the corymb: always preferring to leave the flowers which have the stoutest stalks, and those which are nearest the centre. This operation has the effect of diverting the sap to the flowers which remain, and gives them sufficient strength to set from one to three fruits in each umbel; which will prove a sufficient crop, and well repay the labour bestowed. Another mode, less tedious than the above, may be practised with success, on young trees. It consists in deferring that part of the pruning of them, which is termed shortening the young wood, until the blossoms are in about the same state as is described in the above directions for thinning, and then shortening them back to the required length. This also checks the progress of the sap, and enables the tree to set fruit very freely.---*Gard. Mag.*

ARTICLE VI.

ON THE CULTURE OF SHOW GOOSEBERRIES.

BY MR. SAUL.

It was generally supposed some time ago, that to obtain fine show gooseberries, it was necessary to train the trees; and that, if so ...ated, in five or six years, they would become strong, and be sure to ...duce large fruit. The result of seven years' experience, how... r, proves that training is quite unnecessary. Gooseberry-bushes ... only found to produce fruit suitable for exhibition when they are ... or five years old; because the fruit after that age decreases in ... though it increases in number. Gooseberries rarely if ever ...e fruit of a very large size, for more than two years together; ...nerally only one season. The mode usually practised here is, ... a gooseberry-tree out of the nursery in its second year. The ...ar, being the first after transplanting, it is not allowed to bear ...t; but the year following, that is, in the fourth year of its ... in its prime, and will produce its largest and finest fruit.

We seldom hear of the same tree producing equally fine fruit for even two years in succession. The Bumper, which produced the largest berry in 1832, weighing 30 dwts. 18 grs. (19 98); this year, 1833, did not produce any berry weighing above 22 dwts. 5 grs.; and many other examples might be given. There are fewer new gooseberries going out this season than last.---*Gard. Mag.*

ARTICLE VII.

TO OBTAIN A SUPPLY OF YOUNG CARROTS ALL THE YEAR.

BY MR. T. RUTGEE.

In cases where young carrots are required all the year round, the following mode of culture will produce them.

In the first of August, sow a crop of the short-horn kind in a cold frame, and a crop to succeed it, in the third week of August, in a cold frame, the latter of which will come in at least two months after the first. Early in January, sow a crop on a slow hotbed, under glass; and early in February, on a slow hotbed, under hoops and mats. In the succeeding months, sow occasionally in the open ground.

The above brief directions are, of course, sufficient since it is unnecessary to enter into details about soil, thinning, &c. which every one conversant with gardening knows: but, perhaps, a question may arise as to the necessity of sowing in frame in the month of August. It must, therefore, be understood, that these crops are to serve through all the winter; and, therefore, it will be found that glass will be of essential service, as the weather grows cold; and not only glass, but a covering of mats will be necessary, during the night, in severe weather. One thing, however, must be attended to in the use of glass: namely, to be careful to give sufficient air at all times to keep the plants from getting drawn.---*Gard. Mag.*

ARTICLE VIII.—ON THE CULTURE OF SEA-CALE.

BY W. W. CAPPEE, ESQ.

Sea-Cale grows naturally on the sandy shores of Sussex and Hampshire, and in many other places round the coast of England. The buds of some of these plants, during the winter, are subject to be covered several inches deep with the drifted sand, so that in the

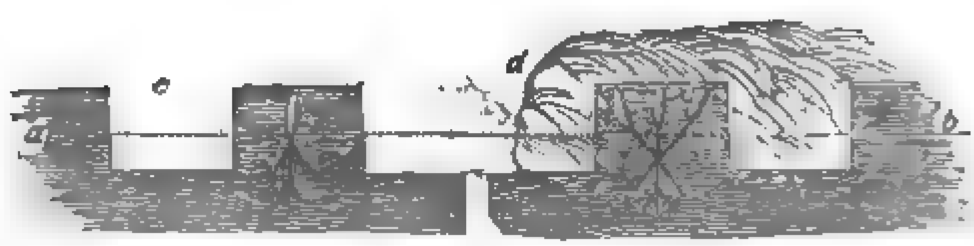
spring, the young heads which push through it have their leaves quite close together. Their appearance, when in this state, being like small cabbages, must have first induced the inhabitants to eat them; and their delicacy and succulency, added to their precocity, must have ultimately led to their cultivation in gardens. This took place probably about the middle of last century.

In the first volume of the Transactions of the Horticultural Society, it is recommended, in a paper dated 1803, to grow sea-cale under large earthen pots; but these are very expensive, and difficult to manage; besides, the plants thus treated are not so productive as they are by the Bath method. My instructor in this method was Mr. M. Pearson, who cultivated a large garden opposite the South-Parade, at Bath; and, although it is upwards of thirty years since he taught me, I do not find that his method has been improved upon. The seed is to be sown very thin, early in April, on a bed of four feet wide, which is to be kept clear of weeds during the summer. It is certainly the best way to raise your own plants; but, as a year is lost in so doing, I should recommend the owners of small gardens to procure them from some neighbouring nursery, as they will cost only from 3s. to 5s. per hundred, and a season is saved. In taking them up, be careful that their roots are not broken, or dried, by exposing them to the atmosphere; for in either case the plants will not thrive with so much vigour the following summer.

Having procured the plants in the month of March or April, select a part of the garden sloping to the sun: its breadth from east to west should be wider than its depth from north to south, that the rains may the sooner run off the ground. The soil should be light, and dug two spades deep, with a moderate quantity of rotten dung well intermixed. Particular attention should be paid that every clod is well broken; for the roots run very deep. Then mark out the whole of the ground from east to west, into divisions of two feet three inches each; down the centre of the second and every other division put in the plants one foot apart. These divisions I shall call the beds, and the others the paths; but remember to begin with one path, and finish at the farther end with another, and put short strong stakes at the corner of every bed. During the summer these paths are to be dug over at least three times, to the depth of ten inches, in order to render the soil extremely fine; but should it be of a close texture, then remove part of it, and bring in the place of what you remove, an equal quantity of sand. On no account use riddled ashes instead of sand, for their rugged surfaces injure the soft cellular vessels of all roots, and hurt their soft expanding leaves.

The plants will not be sufficiently strong the second year of their growth after planting, to be worth forcing with hot manure; but they will be worth the trouble of covering with the soil from the paths. Besides, they must be cut off to increase the number of their suckers. About the third week in February, when the weather is dry, mark out the paths two feet three inches wide, and when the soil is finely broken, lay it upon the beds eight or nine inches thick, so that the beds and the paths, when covered, will appear like *c* in Fig. 16. As spring advances, examine the plants by removing the soil with your hands, and when they are grown seven or eight inches high, cut them off a little below the bottom leaf: their heads will be found perfectly white, and all the leaves growing close together. As you gather the head, throw a little soil over their roots. Although the buds have grown in soil, very little will be attached to them; and this little is easily removed by plunging them into water, holding them by the upper end of the stem.

16



If the weather is settled about the end of April, the beds are to be entirely uncovered; this operation will appear to many to be most extraordinary; but it is essentially necessary, otherwise the few small heads that may be left uncut will go to seed, and injure the plant for the following seasons. The gardener must take a sharp bright spade, and commence at the end of each bed, and throw the soil down into the paths; cutting off every head or parts that may be higher than the original level of the beds, in Fig. 16, *a*, *b*, before the soil was first placed upon them. The vital principle in the roots of the sea-cale is so great, that they cannot be injured by being cut through; as will be seen by the number of suckers or offsets that will arise from their roots. During this second summer, the beds must be kept free from weeds, the paths dug as before, and the plants carefully examined, retaining only four or five of the largest suckers at regular distances round their stems. If the heads of these plants had been left uncut, every one of them would have gone to seed during the

summer, and injured the plants for the two following summers; besides, by cutting them off, they throw up a numerous offspring, to select buds from for future growth. The following winter the plants are to be forced, and before the frosts commence, the beds are to be covered with a little long litter, to prevent the frost from penetrating the soil. About the middle of December, remove the litter from that portion you intend to force, and cover the beds as you did before, with the soil from the paths; then cover that two feet high or more, and also fill the paths with hot manure, so that the whole may be on a level, as shown at *d*, in Fig. 16.

The following Directions are for the Third Year.—In about the fourth week, the heads will be fit to cut: to do which, remove the manure with a fork, then displace the soil with your hand in a very gentle manner, otherwise the leaves will be broken, for they are extremely tender. Cut the heads off a little below the bottom leaf, and cover the roots again with soil and manure, to keep the frost from injuring them. In proportion to the number of beds, the period of forcing must be divided; but where they are numerous, and hot manure is to be regularly had in abundance, it might be wheeled upon the beds and paths as it is made, which will give you a regularly weekly supply; but where no manure is to be had, the plants are to be covered with the soil, and gathered, as before mentioned. The plants, beds, and paths, are to be managed exactly as they were directed to be during the preceding summer; but on no account suffer the beds to be raised even an inch above their original level, although the roots become much thicker. They are still to be cut through with the spade when they are too high, otherwise the beds will be spoiled. After the manure and soil are removed from the beds, during the third spring, dig up every other plant, leaving the others two feet apart, and they will fully occupy the beds; each individual plant during the third summer will consist of many stems, and each of these will send up many suckers. To retain the whole, would not only weaken the plant, but would produce the sea-cale of diminutive growth; therefore leave only four or five of the strongest to each stem, and remove the rest. Those retained will appropriate to themselves the nourishment of those removed, and become larger in consequence.

During the Fourth and future Years, the plants are to be managed according to the directions given for the third; but should too many stems arise from the main root, they must be cut off. As soon as the plants cease to produce abundantly, new beds are to be made; the seeds for which may be saved from the finest plants, by leaving their heads entirely uncovered.

To Dress Sea-Cale.—Mr. Gibbs, the eminent pastry-cook and restaurateur at Bath, favoured me with the following method of dressing sea-kale:—Tie the sea-kale in bundles, boil it in plenty of water, with a little salt in it, for twenty minutes, observing to let the water boil before it is put in; have a toast ready, dip it in the water, put it on the dish and the sea-cale upon it; pour a little white sauce over it, consisting of an equal quantity of veal gravy and cream thickened with flower and butter. If desired, a less rich sauce may be made by leaving out the gravy, and substituting milk for the cream.—*Gard. Mag.*

ARTICLE IX.

LONDON HORTICULTURAL SOCIETY.

On the 4th and 18th of February, the following communications were read to the Society: On the management of Bark Beds in the culture of the Pine Apple, by Mr. John Jackson, gardener at Newby Park, Topcliffe, Yorkshire. Experiments on the comparative growth of Two Pine Apples, by Mr. Donald Munro; and on a method of producing grapes from vine cuttings, the first season, by Mr. John Mearns. If the merit of any new effort in cultivation be measured by the success which crowns it, this is fairly entitled to a considerable share, and much praise is also due for the skill and knowledge evinced in the direction of the experiments, the final results of which have proved so satisfactory. Mr. Mearns's practice is to coil old stems of vines, from five to twenty feet in length, in pots or boxes, leaving a convenient quantity of bearing wood above the surface of the earth; and this, with the assistance of bottom heat, has afforded him fruit of the Muscat of Alexandria, the Black Damascus, and Black Tripoli grapes; the berries of which swelled to a fine size, ripened perfectly, and were of excellent quality. Mr. M's communication also mentioned the fact of his being in possession, on the 8th of January, of a coiled shoot of Millers' Burgundy Grapes, with 20 vigorous bunches of fruit upon it, which had only been put into bottom heat on the 20th of November last. Mr. Munro's paper detailed an experiment which had been conducted in a pine stove in the Society's garden, and stated the difference which existed in favour of a pine plant set in a shallow pan, in which a small quantity of water was constantly maintained, over another, similar in species, age, size, &c. plunged in the tan as is usual; the plant in the water matured

its fruit six days earlier than its opponent, and the fruit had the advantage in weight of 13 ounces.

In the exhibition, the most conspicuous flowers were the Cactus speciosissimus, from the open border, a variety of Amaryllis aulica, Govenia superba, Iris tuberosa, Camelia reticulata, Protea speciosa, Astrapœa Wallichü, Oncidium Carthagimense, Berberis aquifolium, Gastonia Palmata, &c. Specimens of Beurre rance pears from standards, Newtown Pippins, and Lord Bagot's seedling pine apple were also on the table. A programme of the regulations to be observed at the ensuing exhibitions in the Society's gardens was read. The days fixed for them are on the following Saturdays: May 10th, June 7th, July 5th, and September 13th.

ARTICLE X.—MONTHLY HORTICULTURAL CALENDAR,

FOR APRIL.

VEGETABLE DEPARTMENT.

Asparagus.—Fork and spring dress the productive beds, and plant new ones.

Broccoli.—Sow in the first week a small quantity of the *tall large headed purple,* for next April, early sprouting for November till February; at the middle Portsmouth for next March; in the last week Green Cape, Early Purple Cape, and Grange's Early White, for August to Christmas, and the Siberian for April and May next year.

Beans.—Plant Windsor and Longpod, in rows three inches apart.

Cabbages.—Sow a good supply for autumn use.

Cauliflowers.—In the last week sow, to produce in October, and finish planting out those sheltered in frames.

Carrots.—In the first week, and not later than the second, finish sowing the Long Orange, and Altringham.

Celery.—Sow on a warm rich border, and prick out those sown last month,

Horse-Radish.—Sets may be planted in the first week.

Kidney Beans.—In the first week, sow early Buff and Cream coloured in boxes, and in the last week sow on a warm border, in drills two and a half feet apart.

Lettuces.—Sow twice in the month.

Peas of all kinds, sow every fortnight.

Potatoes.—In the last week plant out the late crops.

Radishes.—Sow different sorts twice during the month.

Turnips.—Sow Early Dutch, to succeed those sown last month.
Parsley.—Sow the principal crop.
Spinach—Sow round seeded once a fortnight.
Winter Greens, as Savoys &c. sow in the first week.

FRUIT DEPARTMENT.

Apricot Trees will require looking over as soon as the leaves appear, and if the foliage is curled, or webs are seen, caterpillars are secreted in the buds, open the leaves and destroy them.

Peach and Nectarine Trees must be protected by canvass or woollen netting, from the effects of frost; no heavy covering, however, must be allowed to remain before the trees during the day, unless the weather is very rough, or the fruit will set weakly. The fruit in the Peach houses will now begin to stone, keep the thermometer at 60 degrees during night, and 70 degrees during the day, and give as much air as possible.

Grafting may still be performed in the first week.

Vines now introduced up the rafters in the vinery, will ripen their fruit in August. Vines in pots now introduced ripen fruit the middle of July. Thin, if required, as recommended last month.

FLORICULTURE.

ARTICLE XI.—CULTURE OF THE RANUNCULUS.

THE species of Ranunculus most worthy of the cultivators care are, rutæfolius, isopyroides, glacialis, alpestris, aconitifolius, platanifolius, amplexicaulis, Pyrenæus, gramineus, gracilis, fumariæfolius, Illyricus, acris flore-pleno, repens flore-pleno, macropetalus, Krapfia, Asiaticus and parmassifolius The first section in this genus are all aquatic plants, and not worth cultivation. The aquatilis makes a handsome show in our ponds and rivers. Dr. Pulteney contradicts the assertion of its deleterious qualities, and proves that it is not merely innoxious, but nutritive to cattle, and capable of being converted to useful purposes in agricultural economy. In the neighbourhood of Kingswood, on the borders of the Avon, some of the cottages support their cows, and even horses, almost wholly by this plant. A man collects a quantity every morning, and brings it in a boat to the edge of the water, from which the cows eat it with avidity, insomuch that they stint them, and allow only about twenty-five or thirty pounds to each cow daily. One man kept five cows and one horse so much on this plant, with the little that the heath afforded,

that they had not consumed more than half a ton of hay throughout the whole year, none being used except when the river was frozen over. Hogs are also fed with this plant, and improve so well on it, that it is not necessary to give them any other sustenance till they are put up to fatten. This property of water-crow-foot is the more remarkable, as all the species have been deemed acrimonious, and some of them are without doubt highly so."—*Don's Miller's Dic.*

The rutæfolius, isopiroides, glacialis, alpestris, aconitifolius, pyrenaceus, amplexicaulis, parnassifolius, gramineus, acris flore-pleno, and repens flore-pleno, will thrive in any kind of soil, but moist situations suit them best. The parnassifolius is rather scarce, on account of its being so subject to the attack of snails and slugs in the spring months. As these plants are generally grown in beds, the Bygrave slug-preventer, figured Vol. 1, page 445, will effectually prevent the depredations of these crawling enemies, and it could be fixed round the bed with little trouble. The soil in which they thrive best is equal parts of hazelly loam, vegetable mould and peat. The usual mode of propagation is by seeds. The gracilis, fumariæfolius, macropætalus, Illyricus, Krapfia, and Asiaticus, will grow in any common garden soil, either in a wet or dry situation; these are usually increased by offsets from the roots, and occasionally form seeds. The Asiaticus is the common Ranunculus of florists, the numerous varieties and subvarieties of which make such a splendid show in our gardens in May and June.

To grow the garden Ranunculus to great perfection, it is necessary to subject it to a peculiar treatment. Good rich soil is indispensable and plenty of rotten manure is a desideratum, but certain rules must be attended to, or they will not flourish.

1. The Ranunculus prefers a fresh loamy soil, rather inclined to be strong than otherwise; it also requires to be well manured. Therefore, in preparing a bed take out the old soil to the depth of one foot or more at the bottom of this trench, lay about six inches thickness of well rotted cow dung, then obtain some good rich loam, and break it well, mixing about one-eighth of very well rotted cow-dung with it; then fill the trench with the compost to six inches above the level of the surrounding surface, forming a slope on each side from the middle. This should not be done later than the beginning of October. 2. Plant all the broad-leaved varieties about the end of October or beginning of November, and cover them with some long litter, to prevent their being damaged by the frost; but, if possible, delay planting the narrow leaved ones until February or March; for the latter evidently suffer more from severe weather than the former,

whilst the broad-leaved ones appear to suffer more than the latter from being kept in a dry state all winter; and if kept in sand they are liable to become mouldy. 3. In planting either during the autumn or spring never plant in holes or drills, a practice not uncommon; but, having marked with a rod some lines across the bed, four or six inches apart, place the roots carefully with the crowns upwards, four inches apart in the rows, and lay a portion of sand round and upon each root, and then cover them with not more than two inches thickness of light dry soil. 4. Never select the largest roots to plant for a flowering-bed, for they generally divide into offsets, and seldom flower well; choose the middle size, and your expectations will not be disappointed. 5. It is indispensable that the roots never be allowed to come in contact with raw dung, or they are sure to become more or less diseased. To prevent this, when the roots are taken up, dig the bed to the bottom, turning up, and mixing the old cow dung well with the soil; then Dahlias or ornamental plants may be planted on it till the beginning of October, when the bed should be again trenched, and another layer of cow-dung placed under the soil as before. Take off from the surface about four inches thickness of the old soil, and lay on two inches of new loam, plant on this new soil, using sand, and covering with light dry sandy loam as before. 6. It is indispensable that no raw turf be in the soil in which the roots are planted, or they will be materially injured by coming in contact with it. 7. When the leaves appear above ground, choose a dry day, and press the soil firmly about the roots with the hands, as if the weather proves dry, and the crowns of the roots happen to be exposed, they will suffer material injury. 8. In dry weather they will require watering, and this must be continued, if they require it, until they are in full blow. 9. In situations where the sun has great power, shading must be resorted to, or the leaves will become yellow, and but few flowers will be produced. In all situations shading is necessary when they come into flower, or the flowers will neither be true to their colours, nor the roots so fine as they otherwise would be. This shading may be done either by means of an awning, on hoops and mats; by whatever means it is done, a free current of air must be allowed to pass underneath, or the stems will be weakly and unable to support the flowers. No covering should be nearer the ground than a foot and a half, or two feet. 10. Never allow the roots to remain in the ground after the herbage disappears. The best way of keeping them is in trays or drawers with wire bottoms, and divisions to hold a certain number of each sort; as the tops die, the roots are taken up, and after being picked clean, are

placed in the compartments which are either numbered and placed on a list, or the names themselves are pasted in each compartment. When all are taken up, the trays are placed in a stand in an airy chamber, but not exposed to the sun. At a leisure time the offsets may be separated, and the roots selected for the following year. (See Vol 1, p. 296. 11. If it is desired to obtain flowers late in the season, let the bed on which they are planted be raised no higher than the surrounding surface, by this means it will retain more moisture; plant the roots in the usual way, and give the bed a good watering with lime water to destroy the worms. Afterwards keep the bed well watered with a thin solution of cow-dung and water, until the leaves appear. After they have come up, it is necessary to constantly shade, from ten o'clock in the morning to four or five o'clock in the afternoon, in sunny days; and this must be continued until they have done flowering. 12. To obtain early Ranunculuses, plant in a frame in September, and they will come into flower in January or February. Select roots for this purpose which have been kept out of the ground the previous season of planting, if this is convenient; as they will grow much quicker than those which have been taken up the previous summer. Some may also be planted in pots in the beginning of August; and if they be brought into the greenhouse at different times, a bloom may be kept up from October to February. 13. For a bloom the whole year, begin to plant in February; and plant every fortnight. For a bloom in May plant in February; for a bloom in July plant in April; for a bloom in September plant in June; and for a bloom in October, plant about the middle of July. After this commence planting in frames for winter flowering. 14. To raise good varieties from seed, see Vol. 1, page 264.

Mr. Sweet recommends that the yellow be fertilized by black, the scarlet or crimson with white or yellow, and all the most distant intermixtures. 15. Sow the seed at the latter end of October, or very early in February. Either boxes or pans will answer the purpose; give them plenty of drainage, by laying a quantity of broken potsherds at the bottom, fill the boxes or pans with light loam; sow the seeds thin, and cover them as lightly as possible; water them with a very fine rose watering-pot, and place them in a cold frame or pit.

The plants will be up in about a month or six weeks. They must then receive air night and day, if the weather will permit. They must, however, be carefully preserved from frost. Top dress them with a little fresh soil about the end of February, or beginning of March, taking away a portion of the old soil. About the middle of May, plunge the boxes or pots in the open ground, and water them

until the tops die. When this is the case, take them up and treat them as old roots; and the year following they will in general flower.

A good Ranunculus should have a strong stem, from eight to twelve inches high. The flower should be perfectly round, at least two inches in diameter, consisting of numerous petals, gradually diminishing in size to the centre, lying over each other, so as neither to be too close nor too much separated, but having more of a perpendicular than of a horizontal direction, in order to display the colours with better effect. The petals with entire rounded edges, their colours dark, clear, rich, or brilliant, either of one colour, or variously diversified on an ash, white, sulphur, or fire coloured ground, or else regularly striped, spotted, or mottled in an elegant manner.

ARTICLE XII.

CULTURE OF COMBRETUM GRANDIFLORUM.

THIS is one of the many noble plants with which the once fatal colony of Sierra Leone abounds. It is a scrambling plant, raising itself by means of a very curious kind of hook with which nature has ingeniously supplied it. At first sight one would wonder what this hook could be; for nothing like spine, or prickle, or tendril, can be discovered upon the branches. The want of these, it is necessary should be supplied by some special provision, which is of the following kind. When the leaves are first fully formed, they are seated upon a footstalk of a very common appearance, but, after a time they fall away, leaving but a footstalk behind; the latter does not wither up, but gradually lengthens, hardens, sharpens, and curves, till at last it becomes a powerful hook, admirably adapted for catching hold of the branches of any tree that it may be near, and thus elevating the plant from the earth. These hooks, however, are not to be found on those grown in our stoves, but only in the woods of Sierra Leone, its native habitation.—*Bot. Reg.* p. 1631.

The C. comosum purpureum, and all other species of this genus, require similar treatment to the grandiflora: they are very beautiful, particularly the purpureum, which makes a most splendid show at the time of flowering. They all thrive well in a mixture of loam and peat; cuttings will root freely, if planted in a light soil or sand, and covered with a hand-glass, and placed in the moist heat of a good hot-bed. A good way to obtain fine plants in a short space of time, is to layer some of the branches, which will soon strike root. After they are rooted, pot them off in 60-sized pots, and place them in a shady part of the stove.

ARTICLE XIII.

CULTURE OF THE GENUS CISTUS.

THE *C. ladaniferus* and *Ledon* produce the gum ladanum, but not in such quantities as *C. Creticus*. The resin which is secreted from the leaves and other parts of the shrub is scraped off by means of a kind of rake, called in Candia, *Ergatiri*, to which numerous leathern thongs are appended instead of teeth. This instrument being drawn backwards and forwards over the plant from time to time collects the resin. Dioscorides says they gather the Ladanum by means of goats, which browsing on the leaves of the shrub, return to the stable with their beards loaded with a fat substance, which the peasants rake off with a kind of comb made on purpose.

The species of the genus *Cistus* or *Rock-rose* deserve to be cultivated in every garden for the beauty of their flowers and leaves. The greater part of those called frame shrubs, will survive a severe winter, if planted against a south wall so as to be covered with mats in severe frosts; but, notwithstanding we would recommend a plant of each of these tenderer sorts to be kept in the greenhouse during winter, and to be planted out in the spring. They may be either increased by seeds or layers, or by ripened cuttings, taking off in July or August, which if planted thinly under a hand-glass will root readily.—*Don's Millers Dictionary*

ARTICLE XIV.

CULTURE OF THE GENUS HELIANTHEMUM.

THE hardy shrubby kinds of this genus are amongst the most beautiful little shrubs for ornamenting rock-work. The frame and greenhouse kinds should be planted in pots in a mixture of sand, loam, and peat, so that they may be protected during winter by a frame: the smaller kinds of these may be planted out on rock-work during the summer months. Ripened cuttings will strike root freely, if planted under a common hand-glass in a sheltered situation, in August or September, or they may be raised by seeds, which ripen in abundance. The perennial and biennial herbaceous kinds should be grown in pots, so that they may be protected by a frame during winter in a mixture of sand, loam, and peat; they are easily increased by seeds. The annual

kinds are all beautiful plants, and the seed requires to be sown in the open borders; they prefer a light rich soil. All the species of Helianthemum deserve to be cultivated in every collection, on account of the elegance and various hues of their blossoms.—*Ibid.*

ARTICLE XV.

New and very Rare Plants, figured in the Periodicals for March.

CLASS I.—PLANTS HAVING TWO SEED LEAVES OR COTYLEDONES.

ROSACEÆ.

Rosa indica niveæ.—White Noisette Rose. This has been imported by Mr. Dennis, of Chelsea, from France, under the name of Aimie Vibert, and is doubtless a hybrid production: most probably originated between Rosa indica and Moschata. It requires a rich loamy soil, is increased by cuttings, and requires the same treatment as the Noisette Rose. It is an extremely free flowerer, often bearing from forty to fifty blossoms in a cluster, and on account of most of the young shoots running to flower, cuttings are obtained with difficulty.—*Sweet's Fl. Gard.*

LEGUMINOSÆ.

Adesmia viscosa, Clammy Adesmia. The present interesting addition to the cultivated species of Adesmia is, perhaps, entitled to be regarded as the most showy of the whole genus, the flowers being double the size to those of most other species, and of a rich gamboge yellow. It forms a small shrub, and is copiously studded with glands, which give out, especially in the dried state, an agreeable balsamic odour. It is a native of Chili, and was raised from seeds received in 1832, by Messrs. Allan and Rogers, of Battersea. The plant succeeds best in a light loamy soil, and may be increased by cuttings, or by seeds. It requires the protection of a pit, or frame in winter.

POMACÆ.

Pyrus crenata.—Crenated Bean Tree. This is one of the trees that, along with the P. lanata or Kamunensis, which is a mere variety of Pyrus Aria, recalls to the mind of the British traveller upon the mountains of India his own land, and the sweet scenery of the West of England. Nature seems to have intended it to brave the utmost inclemency of climate: for in its own country, in the earliest

spring, the leaves, while still delicate and tender, are clothed with a thick white coating of wool; and the flowers themselves are so deeply immersed in an ample covering of the same material, as to bid defiance even to Tartarian cold. But in proportion as it descends towards the plains, or as the season of warm weather advances, it throws off its fleecy coat, and at length becomes as naked and glittering with green as the trees which have never had such rigour to endure. In England it scarcely acquires any part of its natural woolliness, but is as naked as our Common Bean Tree. It is found naturally in the highest of the mountainous parts of Northern India. The tree is to be increased by grafting on the Whitethorn.—*Bot. Reg.*

ACANTHACÆ.

Beleoperone oblongata, Oblong-leaved Beloperone. A pretty species of hothouse plant, native of the Brazils, whence it was originally introduced into Prussia. It was obtained from France by Mr. Knight, Nurseryman, in 1832. It is cultivated, like all the tribe, without any difficulty, and is easily multiplied by cuttings.—*Bot. Reg.* The flowers are rosy purple.

MALPIGHIACEÆ.

Stigmaphyllon aristatum, Awned Stigmaphyllon. A native of the tropical part of South America, and consequently requiring the heat of the stove. It is a handsome yellow flowering climber, flowering in June, July and August, and propagated by cuttings.—*Bot. Reg.*

CLASS 2.—PLANTS HAVING ONLY ONE SEED-LEAF OR COTYLEDON

ORCHIDEÆ.

Bartholina pectinata, Pectinated Bartholina. A curious purple flowering plant, native of the Cape of Good Hope. We presume that this, like all the Cape Orchideus plants, is incapable of being cultivated permanently by any means hitherto discovered: for the roots, although when first imported the flower, afterwards disappear. They should be planted in sandy loam, and kept in as light a greenhouse as possible; for it is probable that the reason of their disappearing is the want of light during their growing season in this country.

BROMELIACEÆ.

Billbergia purpureo-rosea, Rose-purple Billbergia. This plant will perhaps yield in beauty to few of its tribe. It is a native

of Brazil, was introduced by that zealous cultivator, Mrs. Arnold Harrison, and flowered, for the first time, it is believed, in this country, in 1832.—*Bot. Reg.* It requires the same kind of treatment as it regards heat &c. as Pine Apples.

ARTICLE XVI.—CULTURE OF CAPE BULBS.

All the Cape Irideæ require one general mode of treatment; which, with a few exceptions, may be stated as follows:—

1. Pot the roots, or plant them in a border in front of a stove or greenhouse, or other sheltered place, during the month of October. Let the soil be composed of equal parts of leaf-mould, sandy loam, and peat, well mixed.

2. If planted in pots, set them in a cold frame, and protect them from severe weather, till the pots are pretty well filled with roots; then remove them to the greenhouse, or room where they are intended to flower.

3. When potted they must be watered very sparingly, until they have produced leaves, and begin to show their flower stems. And after flowering, when the leaves are dead, keep the roots perfectly dry in the pots. If planted in a border or frame, they must be completely preserved from rains, snow, or frost, particularly during their dormant state: in the former case a good thickness of litter will answer the purpose; and in the latter, the frame may be covered with lights.

4. The usual flowering season is April, May, and June, but some species flower somewhat earlier, others later. The plants at that time require to stand in light airy places, and should receive a good supply of water.

5 It is not well to take up the bulbs in less than two or three years, at which times all the offsets should be taken off; but such as are in pots, must be invariably re-potted every October. No person who cultivates Cape Bulbs should be without Streptanthera cuprea and elegans; Sparaxis lineata, grandiflora and tricolor; Ixia Heleni, flexuosa, and viridiflora; Trichonema rosea, and some others.

ARTICLE XVII.

DESCRIPTION OF A PORTABLE HOT-WATER APPARATUS FOR HEATING ROOMS OR CONSERVATORIES.

BY MR. JOSHUA MAJOR.

The apparatus may be made of tin or copper; the latter, though of course it would cost more at first, would, owing to its durability no doubt, be the cheapest. Charcoal is employed for heating the apparatus: oil lamps have been tried instead of it, but with not near so good an effect. As it is necessary to employ pipes to conduct the effluvium, arising from the charcoal, out of the place required to be warmed, it will, in order, to secure all the heat possible, be of importance to introduce a sufficient length to allow the whole heat to pass off, before the ends of the pipes are turned to the outside. In order to make the smoke conductors suitable for any situation, it is only necessary, in addition to the elbow-pipes, to be provided with several lengths of straight pipes, placing one elbow upon the permanent smoke conductor connected with the fire, and the other at the extremity, or midway of the piping, as it may be required. The larger

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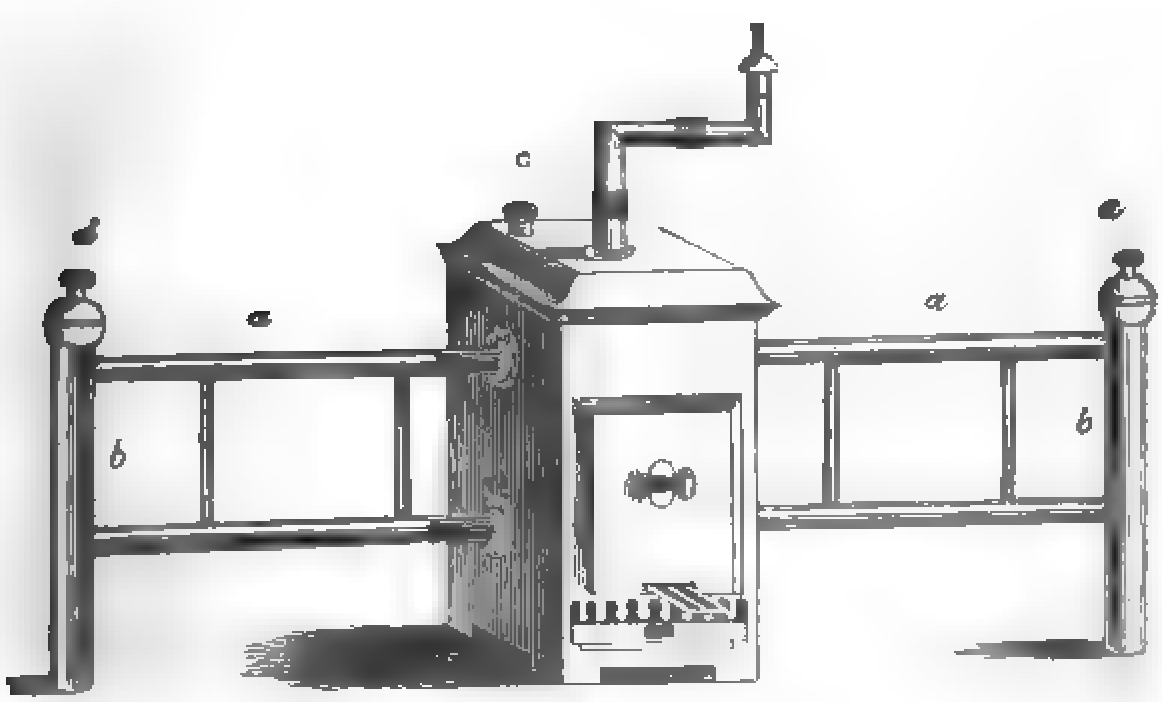

sized apparatus could not well be more than eight feet long; for, if larger, it would be inconvenient to move about. The size of the one which appears the most useful is as follows: The whole height of the centre portion of the apparatus, comprising the boiler, &c. is

15 inches, and width, 5½ inches, by 7½ inches; the fire-pan is 5¾ in. by 4½ inches, and 3½ inches deep; surrounded on three sides by a boiler half an inch in diameter, which becomes more spacious upwards, as the fire place diminishes. The opening necessary for the reception of the fire-pan, and for supplying it with fuel, is 6 inches wide, by 5½ inches deep; at the top of this opening the fire-place commences tapering; consequently the water in the boiler expands more immediately over the fire; the smoke pipe takes its regular width, 1½ inch, in the boiler, about an inch below where the lid unites; the horizontal water pipes (*a*) fig. 17, are each 28 inches long, by two inches in diameter; the end pipes (*b*) are 14½ inches, by 3 inches diameter; a feeder (*c*) is added, in case it should be thought better to have the lid fixed tight on the boiler. In order to promote the circulation of the water small holes are to be perforated in the top of the lids (*d d*) which are also intended to be fixed tight. The apparatus may either be placed on the floor of the place to be warmed, or raised by bearers, or suspended by wire or cord, the two latter methods assist the fire to burn more freely.—*Gardeners' Magazine.*

ARTICLE XVIII.

FLORICULTURAL CALENDAR,

FOR APRIL.

Auriculas' coming into flower must have the small buds thinned out, never leaving more than ten buds, and those the finest size. Shelter from the Sun by shades.

Annuals, both hardy and tender, may still be sown.

Carnations.—Plant of the last year's layers in large pots.

Camelias should now be potted, in doing this attend to the rules.

Biennials should now be attended to.

Hydrangeas may still be propagated by cuttings.

Pomegranates may be propagated by layers about the end of the month.

Mimulus roseus.—Smithü, Youngü, and others, will now be coming generally into flower in the greenhouses. Sow the annual

species in the beginning of the month.

Passiflora Kennesina and other species may be propagated by cuttings about the end of the month.

Pelargoniums now struck in a hotbed frame, and potted off as soon as rooted will flower in November.

Ranunculuses planted in the beginning will flower in July.

Schizanthus retusus, and other half hardy species and varieties should be potted this month if they require it.

Cinerarias of different species may be sown as soon as the seeds are ripe, in pots of light rich earth.

Rose Trees may now be budded, but the buds must have a small portion of wood adhering to them.

Lobellia fulgens may now be shifted into good sized pots, in which it will flower.

Erico.—Cuttings may now be planted in sand, under a bell-glass, and place the pots on a shelf in the greenhouse, and shade them from the Sun.

NATURAL HISTORY.

ARTICLE XIX.—GEOLOGICAL POSITIONS.

(*Continued from page* 163.)

Second Line of Argument.—A river consists of fresh waters of a district, seeking their level in the waters of the ocean.

2nd.—Rivers usually flow in valleys to which their size and force bear no sort of proportion, and which, must, therefore, have been formed by an agency distinct from that of the waters now following through them.

3rd.—These valleys must have been scooped out by a force, similar to that of which we have distinct proof in the valleys of the chalk districts, which have never been occupied by rivers. We are also certain of this having been an aqueous agent, from the well known fact of their always ending on the exact level of the ocean.

4th.—All valleys occupied by rivers terminate at length in this general level, in the same manner as the chalk valleys, without rivers, once did, though these latter are now often cut short by sea cliffs.

5. The bed of every river is a plane, more or less inclined, according to circumstances.

6. As we know that the corroding action of the sea is incessant, and consequently that all sea coasts have been gradually encroaching on the lands, from the very first moment that they became sea coasts; as we also know with certainty, that, at the period when this action first began, the valleys must all have terminated, as they still do, in the exact level of the sea, we have a right to conclude that the time cannot be very distant when this corroding action first began.

7th.—If we assume that the general average decay of a coast is but one foot per annum, (and it will not be denied that it is considerably more upon a larger proportion of coasts) and if we take so short a period, geologically speaking, as only one hundred thousand years, we must suppose that more than eighteen miles have been lost from the original mouths of all rivers.

8th.—Had this been the case, we must have found a waterfall, or rapid, at the mouth of every river: and consequently all inland navigation from the sea must have been impossible, except in perfectly flat countries.

9th.—As we rarely find such falls, or rapids, at the mouths of rivers, and as we have reason to know on the contrary, that their originally inclined planes have neither been materially altered in inclination, nor shortened in extent, we must conclude, that the loss of land on all sea coasts, has, as yet, been but small, and, consequently, that the unceasing action of the waves has been but of recent origin.

10.—As the superficial slopes of all hilly countries lead the eye, in a regular line, to the level of the sea, in about one mile, more or less, according to the consistency of the shores, we cannot avoid the very same conclusion, which we have before attained in a more exact manner, in the instance of the chalk: viz. that all our present sea coasts have been acted upon by the sea but a very few thousands of years, and consequently that all existing dry lands were elevated above the level of the ocean, at the same recent period.—*Field Nat.*

ARTICLE XX.—SPOTS ON THE SUN.

Numerous and fanciful notions have been recently broached on this subject, but only one seems to have any degree of physical probability, viz. that they are the dark, or at least comparatively dark, solid body of the Sun itself, laid bare to our view by those immense fluctuations in the luminous regions of its atmosphere, to which it appears to be subject. Respecting the manner in which this disclosure takes place, different ideas have been again advocated. Lalande

suggests, that eminences in the nature of mountains are actually laid bare, and project above the luminous ocean, appearing black above it, while their shoaling declivities produce the penumbra, where the luminous fluid is less deep. A fatal objection to this theory is, the perfectly uniform shade of the penumbra and its sharp termination, both inwards, where it joins the spot, and outwards. where it borders on the bright surface. A more probable view has been taken by Sir William Herschell, who considers the luminous strata of the atmosphere to be sustained far above the level of the solid body, by a transparent elastic medium, carrying on its upper surface, or rather to avoid the former objection, at some considerable lower level within its depth, a cloudy stratum, which being strongly illuminated from above, reflects a considerable portion of light to our eyes, and forms a penumbra, while the solid body, shaded by the clouds reflects none. The temporal removal of both the strata, but more of the upper than the lower, he supposes to be effected by powerful upward currents of the atmosphere, arising, perhaps, from spiracles in the body, or from local agitations.—*Lardner's Cyclopædia.*

PART II.

MISCELLANEOUS INTELLIGENCE.

ARTICLE XXI.—QUERIES AND ANSWERS.

On Pruning Peach and Nectarine Trees.—Observing a few days since, February 8th, that the buds of my Peach and Nectarine Trees on a south west wall, were swelled almost to expansion, and the trees remained unpruned, I enquired of my gardener as to the propriety of so leaving them. I was answered that he would rather prune them when in full bloom than at this time of the year. The Morella cherries were in a similar condition. Now, Sir, although a tyro, it occurred to me that either the tree or fruit must be injured by its nutritive qualities being absorbed in branches about to be totally severed, or otherwise receive benefit from the absorbtion of its superabundant fluid; and it is upon this point I am anxious to be corrected, as also the most proper time for pruning generally, and the summer foreshortening. My gooseberry trees, although of less importance, are treated in like manner, but the reason here stated is that the birds are apt to destroy the buds in the winter, and that by

delaying the pruning until spring, both parties (the birds and myself) are accommodated. Of course I am not altogether void of a little scepticism on these points, as to utility, and most decidedly adverse as regards appearance. Probably at your early convenience you would supply me, through the *Register*, with a little information on these points?

QUALITY OF GRAPES.—What are the qualities and characters of the Black Esperion, and D'Arbyca Grapes?

PEARS.—What are the qualities and character of the Verlaine, Delices Hardenpant, Colman Espineux, Belle de Jersey, and Colman Josephine Pears?

APPLE PIPS.—Do the pips of apples frequently or rarely produce a like fruit as the apple from whence they are extracted?

DWARF APPLE TREES.—Should Dwarf Apple Trees, planted on the sides of a wall, be placed directly opposite to each other, or alternately, as regards the beauty &c.?

APPLE TREE.—Would an apple tree sustain any inconvenience from being planted near a laurel, and the roots nearly or quite come in contact?

T. BUTLER.

CULTURE OF VARIEGATED LAURELS, &c. in answer to a Subscriber, page 43.—Those who seek information through the medium of public periodicals would generally find their queries receive more attention were they themselves more particular in explaining the means which they possess, and the circumstances under which the information must be carried into effect. In some cases it is true, this cannot be necessary, but in many others it is highly so, and an apt illustration of the fact may be referred to at page 43, of the last number of the Register, where the following query appears: "What is the best method of cultivating and propagating the variegated laurel, (or Liger) Laurel, Oleander, Rhododendron, Myrtle and Hydrangea?" Now the ideas most likely to suggest themselves to the minds of those who might wish to answer the queries, would, I presume be something like the following: I know that in many parts of Great Britain the Myrtle, Rhododendron, Hydrangea, and Laurel, are perfectly hardy; while in other parts of the country, the common Laurel cannot even be kept alive without protection, and as the querist, for ought that I know, may either reside at John O'Groat's or Land's End. That my directions may, therefore, be applicable to that particular part of the country, in which he may chance to live, it will be necessary to inform him how they ought to be cultivated, not only at the two extremities of the island, but in almost every intermediate country. However ridiculous this mode of reasoning may

appear, it is really no exaggeration of the case, and I have no doubt there are many who have had occasion to observe the unaccountable caprice and uncertainty which many half hardy plants display in their powers of resisting frost. We have not, for example, any certainty, that because a plant of a particular species is known to be annually killed, when exposed to the winters, in the neighbourhood of London, or any other given place; the same species may not prove more hardy, and endure the rigours of winter some hundred miles further north. Indeed, instances of this kind, though certainly exceptions to the general rule, are by no means rare. I have, however, merely adverted to them, so as the more fully to point out to a "Subscriber" and other querists, the difficulty which often occurs in giving them the information they wish for. It would, I think, be advisable, for those who send queries at all relating to the cultivation of plants, to give not only the name of the country, but the name of the town in which they reside; this, I conceive to be indispensable where half hardy plants are concerned, at least if correct information be desirable.

If by variegated Laurel (or Liger) Laurel, "a Subscriber" means the variegated variety of the common Laurel, he will find it may be readily increased, either by layers put down in spring, or by cuttings of the current year's shoots, taken off with a heel of old wood, about the end of August, or beginning of September, and planted in a moist shady border. The Oleander, may also be propagated by cuttings, two or three inches in length, taken off at a joint, and planted in sandy soil. If advantage can be taken of placing the pot in a close frame, with a little bottom heat, so much the better. The same treatment may be applied with success for both Myrtle and Hydrangea. Rhododendron are generally raised from seed, although sometimes they are increased by layers, enarching, &c. The latter methods are, however, but seldom practised, except with particular species and varieties, of which seeds cannot be procured.

Ten or twelve years ago, in various parts of the woods at Cane Wood, near Highgate, many young plants of Rhododendron had sprung up from self-sown seeds, and at this place there are thousands of seedlings rising in different parts of the grounds, from seeds produced on old plants, and scattered about by the wind, and other natural causes.

The Oleander will seldom fail to flower freely, if kept in a frame, or the coldest part of the greenhouse during winter, and early in spring be removed to a stove, peach house, or vinery. From the time the flower buds make their appearance, the roots ought to be

supplied with water, until the plant has done flowering, but in winter when in a dormant state, it should be kept rather dry than otherwise,

R. MARNOCH.

Bretton Hall, Jan, 30, 1834.

CÆSARIAN CALE.—I am recommended to sow and plant out Cæsarian Cale, as a good green food for cattle in winter. The outside leaves are given to them, and there is a succession of them produced. As there are various opinions on the subject, I should feel obliged by your's, or that of any of your subscribers, and what is the best time to sow and plant out, and at what distance they should be planted from each other, the best soil, &c. If I could get an answer in your next, I need not say it would be very desirable.

J. M. TAYLOR.

RABBITS AND HARES.—I am obliged to your correspondent, "I. J. T," for his communication, as to binding the stems of trees with Gorse, but I fear that it would be found a very tedious operation in young plantations of any extent. Some time since, I tried the yet simple method of placing a few branches of short gorse on the ground, six or seven inches round the trees, and it was attended with success for a time, as long as the gorse retained its thorny roughness. Any further communication on this subject would be acceptable; with reference more particularly to plantations of Forest Trees, Copse wood, and Nursery plants. J. F.

THE NEMATUS CAPREÆ. –Under the head Miscellaneous Intelligence, in the last number of the Register, it is stated that Nematus Capreæ is the name of the insect alluded to, in page 61, as infesting the gooseberry. This I have no hesitation in saying is a mistake. The larvæ or caterpillars of the Nematus Capreæ, a species of saw-fly, are never found on the gooseberry, but feed on the leaves of the sallow, and of several species of willow and osier, to which they are said to be sometimes very destructive. The saw-fly of the gooseberry and currant, though it nearly resembles the former, and has been confounded with it by Fabricius and other Naturalists, has been clearly shown to be a distinct species. [See Kirkby and Spencer's Entomology, Vol. 1, page 197.] The latter insect, so noted for the devastation which, in its larvæ state, it often commits in our gardens, is named Nematus Ribesii by Stephens; and the fly is described by the author of the Treatise on Insect Transformations, in the Library of Entertaining Knowledge, as having a flat yellow body, and four pellucid wings, the two outer ones marked with brown on the edge. As I wish to keep within bounds, I refer for proof of the correctness of the above remarks, as well as for further information on the subject, to the authors whom I have named. SCOTUS.

ARTICLE XXII.

COLLECTIONS AND RECOLLECTIONS.

THE HOTEL DE ST. PAUL, built by Charles the V. was, as is specified in his Royal edict of 1364, intended to be an Hotel of great diversions. Like all the Royal Houses in those times, it had large towers, such being thought to give an air of dominion to the building. The gardens instead of yews and lendens, were planted with apple, pear, cherry trees, and vines, beside beds of rosemary and lavender, peas, and beans, and very large arbours or bowers. The inner courts were lined with pigeon-houses, which the king's tenants were obliged to send, and here they were fatted for his table.—*Ladies' Mag.* 1779.

THE INHABITANTS OF ST. LUCIE have lately discovered a most singular plant. In a cavern of that isle near the sea is a large basin, from twelve to fifteen feet deep, the water of which is very blackish, and the bottom composed of rocks. From these, at all times, proceed certain substances, which present at first sight beautiful flowers of a bright shining colour, and pretty nearly resembling our marigolds, only that their tint is more lively. These seeming flowers on the approach of a hand or instrument retire like a snail out of sight. On examining their substance closely, there appear in the middle of the disk four brown filaments, resembling spiders' legs, which move round a kind of petals with a brisk and spontaneous motion. These legs have pincers to seize their prey; and upon seizing it, the yellow petals immediately close so that it cannot escape. Under this exterior of a flower is a brown stalk of the bigness of a raven's quill, and which appeared to be the body of some animal. It is probable that this strange animal lives on the spawn of fish, and the marine insects thrown by the sea into the basin; it is of that species called animal flowers.---*Mag. of Curiosities of Nature and Art*, 1825.

THE LARGEST BIRD.---Temple in his recent travels in Peru, states that he shot a Condor, and from notes taken on the spot, gives us the following dimensions of its size: When the wings are spread, they measure forty feet in extent, from point to point; the feathers are twenty feet in extent, and the quill part eight inches in circumference.---*Temple's Travels in Peru.*

THE LARGEST FLOWER.---In 1818, Doctor Arnold discovered in the Island of Sumatra, a flower, which he named the Rafflesia Arnoldi, and which an author has called with much justice "the magnificent Titan of the vegetable kingdom." The human mind had never conceived such a flower, the circumference of the full expanded flower is nine feet, its nectarium calculated to hold nine pints,---the pistels are as large as cows' horns, and the entire weight of the blossom computed to be fifteen pounds.---*Penny Mag.*

Note.---Is the above fabulous, or has it been seen by any one else, or has it been introduced into this country?

THE FLOWER TRADE IN HOLLAND.---About 180 years ago, a real tulip mania prevailed in Holland. Bulbs were sold at such extravagant prices, that 13,000 florins were paid for a single Semper Augustus. For a vice-roy, on one occasion, was paid four tons of wheat, eight tons of rye, four fat oxen, and twelve sheep. Until the time of the French Revolution, the florists of Haerlem obtained their bulbs principally from Lisle, and other Flemish towns, where the clergy were engaged in them. Haerlem still continues to be the emporium for the most beautiful of these productions. Hyacinths first began to rise in estimation in 1730, in that year 1850 florins were paid for one passe-non-plus-ultra.---*Mirror,* 1832.

NATURE AND ART.—It is curious enough that people decorate their chimney pieces with imitations of beautiful fruits, while they seem to think nothing at all of the originals hanging upon the trees, with all the elegant accompaniments of flourishing branches, buds, and leaves.—*Cobbett's English Gardener.*

FACULTIES OF BRUTES.—The dog is the only animal that dreams, and he and the elephant the only animals that understand looks, the elephant is the only animal that, besides man, feels ennui; the dog the only animal that has been taught to speak, Leibnitz bears witness to a hound in Saxony, that could speak distinctly thrilly words, if we can put confidence in what he writes.—*Medical Gazette.*

SEA AIR.—The atmosphere in the vicinity of the sea usually contains a portion of the muriates over which it has been wafted. It is a curious fact, but well ascertained, that the air best adapted to vegetables, is pernicious to animal life, and *vice versa.* Now, upon the sea coast, accordingly, animals thrive, and vegetables decline. *Hurwood's Southern Coast.*

MUSHROOMS.—The large horse mushrooms, except for catsup, should be very cautiously eaten. In wet seasons, or if produced on very wet ground, it is very deleterious, if used in any great quantity. —*Mag. Nat. Hist.*

Age of Trees.---There are various opinions as regards the full age or natural life of trees. Evelyn and others imagine, that from three to four hundred years form the life of the oak. In Mr. Gilpin's work on Forest Scenery, there is an account of oak trees in the New Forest, that had marks of existing before the conquest. The tree in the same forest, against which the arrow of Sir Walter Tyrrel glanced and killed King William Rufus, remains still a tree, though much mutilated. In Mr. R. Lowe's View of the Agriculture, of Notts, several trees are said to have been felled in Sherwood Forest, which were found to have cut into them I R and some In Rex, with a crown over the letters.

Of Pruning to Improve the Quality of Timber.---With regard to the purpose of improving the quality of the timber, I do not know in what manner it can be imagined to have the effect of producing an union between the old and new wood; for all the effects I know of are injurious to the quality of the timber. It is a fact not generally known, that whenever a bough is cut from a tree, no union ever can take place between the wounded part and the new wood. The end of a branch, where cut off, may be imbedded in the new wood, but I believe there never can be a perfect union; I never could, in any of the timber I have seen sawn open, discover the slightest inclination in the new wood to unite with the end grain of a bough cut off; and no person has so good an opportunity of observing the effects of pruning, as he who is continually seeing pruned trees opened. Pruners would, perhaps be more cautious were they continually to bear in mind, that every bough cut off near the stem, causes an irremediable blemish in the timber. If the bough cut off, be too large for the new wood to grow over before decay takes place, a rotten part is enclosed, or partly enclosed; and if, either through protection, by means of cement or otherwise, the wound be covered by new wood before decay takes place, still there is a blemish in the timber; for the new and old wood will not unite. It is said by some that the sap of wood will unite with the young or newly formed wood, this is not true; no union ever takes place between any part of the end grain of a bough cut off, and the wood that is afterwards formed. Experienced timber-dealers know well that pruned timber is less valuable than unpruned timber, and that the more trees are pruned, the less valuable is the timber they produce. Trees that have never been pruned nor had their limbs, stems, nor roots mutilated, may be depended on as sound: their stems are almost certain to be free from decay, or any other kind of blemish, for this plain reason, because the whole of their substance, even to their centre is alive. It has

been stated before, that when part of the roots of a tree are destroyed, some of its branches die; and when that part of its branches are destroyed, some of its roots die. Can it be wondered at then, that the stem, which is the channel of communication between the roots and branches, should be injured by having a portion of its substance rendered useless? So long as the fibres and tubes which compose the stem are kept in use, and have a stream or current of sap flowing in them, there is no chance of decay; it is impossible that decay can take place under such circumstances. How desirable then is it, that the circulation of the juices through the stem should not be stopped or checked. When the limbs of a tree are cut off, some of the sap vessels of the stem are rendered useless, and being of no use, they contract, and often decay. Their contraction occasions what carpenters call shakes; and in a tree that has lost many boughs, it may be seen that a certain portion of the middle of its stems has contracted and separated from a ring of live wood, which is at the outside of the stem, forming a hollow cylinder, enclosing the contracted dead wood in the centre.

This is a very common blemish in pruned timber; but it cannot be discovered till the stem is cut through. This is one of the least injurious effects that pruning can have on the quality of timber: the worst, and by far the most common is, decay, which is almost certain to take place at the part where a bough has been cut off, and which seldom fails sooner or later, to extend itself through the whole stem.

Pruning cannot improve the quality of timber by reducing knottiness. A live knot in timber every carpenter knows to be less hurtful than a dead one. It is impossible to reduce the number of knots by pruning, but almost certain that the number must be increased. Those who imagine that timber may, by pruning, be rendered less knotty, must know but little of that admirable property in trees, to adopt the best shape for their situation: they never could have compared the shape of a detached and unmutilated tree in an open situation, with that of one growing in a grove, and closely surrounded by other trees. Let them well consider what is the cause of the difference in the forms of the two trees; and when they have discovered and well understand this, I will answer for them, they will not attempt to procure the long knotless timber of the grove, from the detached tree.—*Ballad's Treatise on the Nature of Trees.*

THOMAS HARDCASTLE PRINTER, CHURCH-STREET, SHEFFIELD.

THE

HORTICULTURAL REGISTER,

MAY 1ST, 1834.

ARTICLE I.

A SURMISE AS TO THE POSSIBLE CAUSE OF HYDROPHOBIA.

BY VIOLA.

IT would afford me much gratification, to ascertain if the following circumstance be correct, and can be corroborated by the observation of experienced naturalists.

It is well known, that dogs and cats are in the habit of occasionally eating grass: as some persons conjecture, when instinct teaches them that they require medicine; while others (Doctor Jenner among the number) suppose it to be "a sign of rain." Whatever be the cause,—the *fact* that animals *do*

"Leave mutton bones on grass to feast,"

no one can be ignorant of.

Some months since, my attention was attracted by our yard dog, who appeared restless and uneasy, and was whining and pulling at the full length of his chain. I was induced to have him unfastened, and watch the result. On finding himself at liberty, he ran immediately into the orchard; and after having investigated several tufts of couch grass, selected one of them, and proceeded leisurely and carefully, to snap off, one at a time, a few full grown blades, avoiding to eat either their tips or the lower part; refusing also the very young leaves, or those on the outside. I followed the dog from tuft to tuft, for a very considerable time, and saw, to my surprise, that each root was treated precisely in a similar manner, the ends of the blades remaining on the ground.

When the animal had finished his epicurean salad, he ran away to a merry game with a little boy.

My attention having been thus aroused, I have ever since attended to his petition to be let loose, that he may seek for grass; and I

have never found him deviate from that method of eating it, which has been described. I have lately noticed too, that cats select only the matured blades of couch.

This singular circumstance has so much surprised and interested me, that I am anxious to know if it has been observed by other persons.

Is it usual for animals in a perfectly wild state, to be afflicted with that awful disease hydrophobia? Have we not more frequently heard, that *dogs which are chained*, are more liable to become rabid, than others that are left at liberty?

Is it not too likely, that we may through inattention to their habits, cause our attached and faithful animals to fall victims to a frightful malady; and in consequence, increase the list of

"The thousand ills that flesh is heir to,"

by creating another "ill," for the human race to suffer, which would not otherwise be included in the formidable number?

I am not asserting,—for I know nothing; I would merely with "earnest diffidence" state a fact, and venture a query, which appeared to me to arise out of the reflections which the circumstance induced.

"Want of water,"—"heat of the dog-days," &c. will no longer satisfy an intelligent and reading people, when assigned as causes for hydrophobia. We know that dogs *do* go mad, in all seasons, under all modes of treatment,—and that the cause of the sui generis disease, is yet unknown.

I incline to think, that in almost every case, when I have heard that a dog has suffered from this disease, (and when of course, it has not been communicated; but has originated with the animal,)—it has always been said, "the dog went mad, broke his chain, and ran away."

It is a lamentable reflection, that with the best intentions,—the kindest dispositions,—we may, and perhaps *do* inflict misery, on the very creatures which we best love,—that most deserve our care, and whom we are most bound to cherish,—I mean those that we can take from a state of nature, and for our benefit and convenience, place out of all possibility to obtain that necessary aliment, or natural medicine, which is evidently intended for their health and comfort.

It would cause me more gratification than I can express, if these vague hints should meet the eye of a kind, reflecting influential investigator of natural history, who would instruct himself in the subject, and endeavour to befriend the canine race, (to say nothing of human beings,) by publicly advising, that all dogs which are chained

up, should be allowed a daily ramble, if but for half an hour, in order to recreate, and keep themselves in health! From a lowly tea-kettle on a kitchen-range, sprang the wonder-working powers of the steam-engine:—let no one smile in derision, if I hazard the hope, that from my casual observation—that a tuft of grass constituted the ultimatum of happiness to a little dog,—one* of the most terrible disorders—hydrophobia, may be exterminated from among us!

ARTICLE II.

THE FOSSIL FLORA OF GREAT BRITAIN.

(Continued from page 159.)

It would be out of place here, to recapitulate what has been already said of the form and nature of this strange fossil; but we must be allowed to observe, that the opportunities of further examination afforded by these several specimens, have proved that the centre was a continuous homogeneous cup, or dome, and not the remains of the arms squeezed into a single mass, as we formerly surmised it might be. We have, also, been furnished with the most convincing evidence of the leaves proceeding from the stem in all directions, thus:

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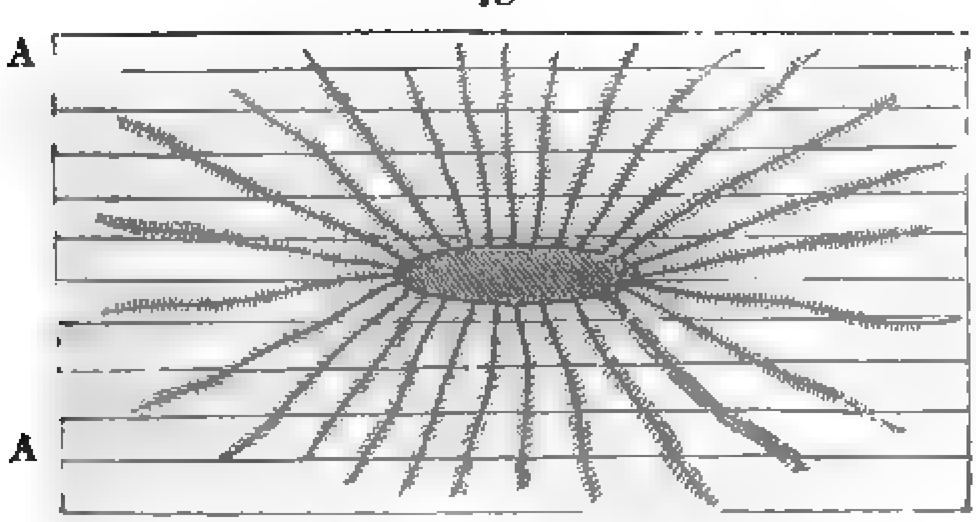


(A) Layers of Shale.

and, although we must still oppose the great length assigned to the leaves by that intelligent observer, Mr. Steinhauer, of twenty feet, to have originated in some error of observation, it gives us pleasure thus further to confirm the views originally taken by him, of this singular tribe of plants; we have, ourselves, seen the leaves well defined, three feet long.

Could it be possible for these plants, of a yielding fleshy substance, with numerous arms proceeding on all sides from a central dome, to be floated from the dry land, and buried in the mud of an estuary, without being broken and squeezed—the extent of the out-stretched arms, when perfect, having been at least twenty to thirty feet? If they had been so floated, they must of necessity, in sinking down upon the muddy surface, have become flattened, and could not have presented the convex form we now find them invariably in. The leaves, also, which thickly surrounded the arms, could not, under any circumstances, even supposing them to have been hard woody spines, (which they assuredly were not,) have taken the direction in which we now find them, proceeding from the stem on all sides at right angles to its axis, and penetrating the shale, even perpendicularly up and down, to the extent of two or three feet, at least; had the plants been floated, the leaves, on the contrary, must of necessity have been pressed upon the arms, surrounding which we should have found their remains, in confused masses, and spread out irregularly by their side, in the plane of the surface on which the plant had finally reposed; none of this, however, takes place; but, on the contrary, when the shale is split, so as to expose the surface of the fossil, the leaves are seen proceeding, with the greatest regularity, each from its separate tubercle, those only being distinct in the length and breadth, which, when in a growing state, had been shot out in the plane which is now the cleavage of the shale. (See plates 32 and 33, vol. 1.)

From all these circumstances, we are compelled to conclude, that these Stigmariæ were not floated from a distance, but that, on the contrary, they grew on the spots where we now find their remains, in the soft mud, most likely, of still and shallow water. It is worthy of observation, that the fossil remains of a Unio, (undescribed,) occur, in considerable abundance, associated with the Stigmariæ, but, in a shale, which forms the covering of the high main coal in the same colliery; and about forty-five fathoms above the Stigmaria bed, as we may very appropriately designate it, there is, in one spot, a considerable accumulation of this same fossil Unio; the coal has been worked out under the layer of shells, in all directions, and they are found to cover an area of 5000 square feet. The shells are partly embedded in the coal itself, (which is spoiled by them,) and partly in the shale above it; the bed is about eighteen inches thick; the animals have, evidently, died at various ages; and the shells of all sizes, are, many of them, gaping open. As it is impossible to conceive these, consisting of one species only, to have been brought

from a distance, and deposited here, we must conclude, that this bed of shells, (and there are many more known in other parts of the series,) marks what had been, for some considerable period, as compared with the age of man, the uppermost surface of the earth, upon which fresh, and, probably, still water, had reposed, as in the before-cited case. Now, although it may be true, that the presence of organic remains in any stratum, be evidence sufficient of its having once been at the surface, yet the additional evidence in these cases, is so far valuable, as it proves that these beds remained uncovered for a period of considerable duration; long enough, indeed, for plants of a large size to flourish, and beds of muscles of considerable thickness to form, by the successive growth and decay of the animals.

What an amazing idea is thus forced upon us, of the length of the period which might elapse, during the deposition of the Coal measures alone, where the beds here referred to, are but two in hundreds, any one of which may have been as long uncovered by its successors in the series; and what is the whole of the Coal formation, compared with the great mass of the secondary strata ?—a single layer of stones in a stupendous edifice !

It has been already stated, that one of the seams of coal in the Northern Coal Field, is known over an area of 200 square miles; now, supposing this seam to have originated in the way generally believed, by a sweeping of vegetables from the land, could we, in any case, conceive such a mass floated down at one time, as to cover such a space ? And if this bed be also spread over the formation where it has not yet been worked, we shall have to double or treble the space; if it had been so produced, is it likely it would have presented, throughout the whole of this extent, an absolute continuity, and an even thickness—this thickness being at the same time, so inconsiderable, as rarely to exceed six feet ? Should we not rather have expected to find the vegetable matter unequally spread, and irregularly accumulated ?

Again, if this seam of coal had originated in the violent action of a current of water, sweeping vegetables from the spots where they grew, would not some of the soil and detritus in which they vegetated, or the loosely aggregated matter which then, at least periodically, existed in abundance, be washed down and mixed with them ? There is no evidence of violent action whatever in the beds of the coal measures; there is not any thing approaching a conglomerate, the grains of sand comprising the sandstone being the largest transported fragments visible. It is one remarkable character of the seams of rich coal, that, from the floor to the roof, (to use the miners expres-

sive terms,) they contain no foreign admixture whatever. Occasionally thin layers of sandstone, or shale, occur, by which the seam is partially divided into two or more parts, indicating a slight partial effusion of stony matter over the surface of the vegetable mass, whilst it was yet forming; but this is the exception to the rule; and only one instance, that we are aware of, has ever occurred, of a rolled fragment of stone being found in the coal, and that was a pebble of water worn grey quartz, in Backworth colliery, near Newcastle; we may be tolerably certain that such a circumstance is not common, as the high character of the Newcastle coal arises, in part, from the total absence of foreign matter.

Other arguments, to prove that the plants which formed coal were either not drifted at all, or at least not from any great distance, may be found not only in the perfect state of the leaves of many Ferns, but in the sharp angles of the stems of plants which there is every reason to believe must have been of a very succulent nature, such for example as Favularia tessellata, tt. 73, 74, and 75 of this work; and many of the Sigillarias, some of which occur with their surface marked with lines and streaks so delicate, that a day's drifting would have injured them. Again, at t. 76, we have figured a cluster of the fruits called Cardiocarpon acutum; had these been drifted one would think they must have been dispersed, instead of being collected into one spot, just as if they had fallen there from the plant that bore them.

That the fossils which we find irregularly interspersed in the sandstones, or shales, of this formation, may have, in some instances, originated from drifted vegetables, there is, perhaps reason to believe; thus it may have been with Dicotyledonous trees, fragments only of whose stems have been traced 70 feet long, without either extremity being seen; these we are sure must have grown upon a dry surface, and that surface have been unchanged for many years. And, in fact, they are found in just the state in which we should expect to find drifted stems, their limbs shattered, their bark beaten and rotted off, and their wood in a high state of decay. But that any considerable part of the plants which formed the beds of coal were drifted at all, appears, from the foregoing remarks, to be highly improbable; that they should have been brought by equatorial currents from the regions of the tropics, is perfectly chimerical.

When such a mass of vegetable matter as is now periodically brought down by the Mississippi, is deposited upon mud, or sand, of which the bottom of some of its branches, or bays, may consist, and is there covered by another bed of sand, or mud; is it likely,

that, if, at any future period, the Carbonaceous deposit should be removed, the surface of the beds, either above or below it, would be even and flat? Would it not rather be found, that the interstices and inequalities which there must be betwixt the trunks of the trees, had been filled up by the matter which covered the mass, and that some of the stronger stems, having settled unequally, had stood out, penetrating the surrounding soft strata, either above or below? Something of this kind, under similar circumstances, must, at all times, have been the case; yet, nothing like an indication of it attends our coal beds, for, not only are they, as before observed, free from the admixture of matter foreign to the formation, but the surfaces by which the coal is separated from the beds above and below it, are as even and well defined, as those of the limestones in the lower part of the series.

From the circumstances already related, we are compelled to the conclusion, that the beds of coal chiefly originated in vegetable matter which lived, died, and was decomposed, upon the spots where we now find it. The analogy of Peat, at the present day, naturally suggests itself; and, according to this view of the subject, we must consider each of our coal beds as having originated in an extended surface of marshy land, covered with a rank luxuriant vegetation. Should the length of time required for such an accumulation of vegetable matter suggest itself as a difficulty, it may be in part got over, when we bear in mind the fact of the enormous size of the individual plants, and that all those having any living analogues, sufficiently attest a much more rapid growth, consequent upon a heated humid atmosphere, than, at present, is any where known to take place. The difference is, probably, not greater betwixt the stunted growth of an Iceland vegetation of the present day, and the rank luxuriance of a tropical swamp, than between even the latter and the vegetation of the Carboniferous period.

The remains of Stigmaria are so abundant throughout the whole of the Carboniferous formation, that it is impossible to travel far along any road, without its form being detected by the practised eye. In some of the best and most closely observed instances of its mode of occurrence in the bed before described, the arms could be traced from the central dome, slanting downwards into the coal, where all trace of them was completely lost. Coal, which rarely bears any outward vegetable form, presents that of Stigmaria oftener than any other, and it is certainly one of the most abundant fossils of the whole formation; from which facts, we should appear to be fully warranted in considering, that the growth of plants of this class was

one of the great means made use of by the Almighty Architect of the globe, in absorbing and rendering solid that excess of Carbon, which it is believed, must, at the period of the formation of the coal-measures, have existed in the atmosphere; thus rendering it fit for the support of animal life, and, at last, a proper habitation for man. We cannot contemplate this storing up such a mass of combustible matter, and the iron which always accompanies it in the depths of the earth, at a remote epoch, for the consumption and enjoyment of creatures, afterwards to exist on its surface, without being struck with the benevolence and wisdom manifest in the design.

Whilst contemplating a bed of coal as the product of vegetation swept from a higher level of dry land, the question is ever recurring —where was the land?—a question which, as far as we know, it is impossible to answer, and which might be considered alone sufficient to shake the theory of the coal-plants having been drifted from neighbouring hills. We are well aware that this is but one of a thousand questions in Geology more easy to propound than to solve; but, surely, there ought to be some indication of those rocks, of anterior formation, on which this mass of vegetation grew; the surface that could supply so much, could be of no inconsiderable extent. That the plants had not been brought from a great distance, is proved, by the perfect state of preservation of the most delicate filmy leaves. The only rocks of the older formation, near to the great northern Coal-Field, are the Cumberland group, and the Cheviots; but it is certain that the former were protruded at a period long subsequent to the formation of the coal-measures; and, although there is in the case of the Cheviots a want of evidence to carry us so far up in the great series, yet we are sure that they rose, after the deposition and consolidation of the older members, at least, of the Carboniferous formation. The beds below the coal measures, do now rise, at their western edge, to a height somewhat mountainous; but here, again, we have proof of a rising, long posterior to the formation of the coal; and they are, besides, a part of the series we are considering, and are characterized by the presence of the same class of vegetable fossils as have, doubtless, formed coal.

There are three principal varieties of Bituminous Coal, each of which occur in the Northern Coal Field; viz. fine caking coal, which is a crystalline compound, breaking into rhomboidal fragments; Cannel, called also Splint, and Parrot Coal, which is compact and tough, breaking with a conchoidal fracture; and Slate Coal which is a mixture of the two other varieties, in thin horizontal layers.

The finest caking coal, of which the Newcastle Coal Field princi-

pally consists, being, as before stated, a crystalline compound, its constituents must have been in a state of solution. Cannel, or Parrot Coal, often bears the impression of plants, as does the third variety; but it is possible to prepare slices of all of them so thin as to be transparent, which, upon examination by the microscope, show the tissue of the original vegetables very clearly; Cannel coal seems to retain it throughout the whole mass, whilst it exists in fine coal in small patches only, which appear, as it were, mechanically entangled.

By the microscopic examination of coal, a singular arrangement becomes visible; a number of elongated tubular passages are found, filled with a beautiful wine-yellow coloured resinous matter, which is the most volatile part of the solid coal, being what is first driven off when coal is exposed to heat. Each variety of coal exhibits this structure in a greater or less degree, but fine coal the least, as, in it, the vegetable elements appear to form an almost perfect union. When the different varieties of coal occur together in the same seam, or bed, as they frequently do, they are not indiscriminately mixed, but have a well defined line of separation between them. In Wylam Colliery, near Newcastle, the principal bed of coal is, at its lower part, a fine splint, approaching Cannel, the middle and main part is crystalline coal, and the upper part of the seam is a mixture of the other two, in alternate layers, thus presenting, in one seam, all the three varieties of the Newcastle district. But it is not the seams of coal only which exhibit these abrupt changes of nature, as small specimens may be gathered at the 'mouth of every mine, which, within the compass of an inch, will, upon their perpendicular faces, show alternate layers of fine crystalline coal, and coal destitute of crystalline structure. It is certain each bed of coal, and more particularly each separate layer in that bed, must have been placed in precisely similar circumstances since the deposition of the vegetable matter of which it is composed; and we cannot suppose that matter to have obtained any of its elements after it was buried in the earth, but rather that the difference between the several varieties of coal and recent vegetables, as shewn by analysis must have arisen from the play of affinities which has taken place in the mass when reduced to such a state as to allow of motion amongst the particles, (the result of the most complete solution of the fibre being the finest coal, whilst in the indifferent varieties this motion appears to have been obstructed by the tissue,) from which it seems naturally to follow that the several varieties of coal arise from some difference existing, previous to deposition, and that difference is most likely to have been, originally, in the nature of the plants, of whose remains the coal beds consist. If we are right in this con-

clusion, we are thus furnished with an additional argument against the common opinion of the origin of coal; if the vegetables had been washed from a distance, is it likely that the different kinds would have separated so completely, as to have produced the several varieties of coal, so distinct from each other? often in layers, far too thick and continuous for us to suppose them to have originated, but from a multitude of plants of the same kind. However this may have been, we have little doubt of being able to pronounce, with tolerable accuracy, as the knowledge of the subject extends, what the plants were, the remains of which are of such incalculable value to us in the form of coal.

It was at one time believed, that the remains of Dicotyledonous woods did not exist in the Carboniferous formation; but subsequent observation, aided by the power of the microscope, which has been applied with so much perseverance and effect, by our esteemed friend and fellow labourer, Mr. Witham, has enabled us to detect them in almost every quarry. Nevertheless, the great bulk of the vegetables, of what may emphatically be called the Carboniferous period, undoubtedly have been of the genera Sigillaria, Lepidodendron, Calamites, Sigillaria, and Ferns. The more woody plants, on the contrary, after being buried, were able to resist decay, until their fine tissue was completely filled up and sustained, by the gradual infiltration of mineral matter.

It is in consequence of the almost universal change into coal, which has taken place in plants of this period, that their internal organization is so obscure; but, fortunately for our science, individuals are sometimes found uncompressed, and retaining the form of their internal organization in considerable perfection.

Mr. Witham has thus, already, been able to detect the structure of a Lepidodendron, which was fortunately found by the Rev. C. G. V. Harcourt, and upon which we shall have to make some observations in the present volume. To this part of the subject we should wish to direct the attention of our friends, more particularly such as may be resident in those Carboniferous districts where Calcareous Spar, and Sulphuret and Carbonate of Iron, abound; it is only where mineralizing matter has been held in chemical solution in abundance, that we can expect to find the delicate and evanescent textures of the coal fossils preserved. By careful examination in such situations, and the aid of the microscope, the secret of their real nature will be revealed.

HORTICULTURE.

ARTICLE III.—CULTURE OF VINES WITHOUT POTS,

BY MR. GEORGE CHERRY,

Gardener to Captain Howard, Heaton-Norris, Lancashire.

THE rapid improvements made in the culture of pine apple, during the last twenty years, must be well known to most growers. In November, 1831, having about forty plants, I prepared a pit for their reception, by turning over the old bark to the bottom, and laying one foot thickness of new bark on the top. I then took the plants out of the pots, and planted them in this situation, and I never saw plants thrive better. In February, I stripped off a few of the bottom leaves from the plants, and added about three inches thickness of new bark to the bed, which greatly assisted their growth. On the first of March, they showed fruit of a good size, and produced suckers double the size of those grown in pots; they did not require watering, except by means of a syringe, until the latter end of June. I find suckers also root the best in new bark, without pots. Make up a bed for a good sized melon frame, and when there is a good strong heat, I plant the suckers near together, and in four or five weeks they will be well rooted; then I carefully take them up, without disturbing their roots, and put them in pots according to their size. The sort of pine I have tried is the Montserrat; I intend trying the New Providence next year. The finest of these I have seen for some time are now growing at Mr. Manlaud's, Wood Bank, near Stockport.

I intend shortly to send you an article on the treatment of Pelargoniums, as it regards blooming them to great perfection in small pots.

Heaton-Norris, March 1st, 1834.

ARTICLE IV.—ON VINES IN POTS,

BY MR. STAFFORD.

FROM the numerous enquiries after the success of some vines I had in preparation last summer, I am induced to forward you the particulars of their progress for the information of the readers of your *Magazine.*

In May last, I put thirteen plants, struck the previous year, into pots, part of which were of the size I formerly recommended, and

the others as near half the size as I could select. In the first week in January, I placed them in my usual place, where they have shewn 730 perfect and well formed bunches, those in the small pots are equally as productive as their neighbours in the larger ones; and by a process I wish to explain; namely, putting a large feeder under each pot, in which should be put about three inches of rich light earth. I have no doubt but they will perfect their productions well; the apertures at the bottom of the pot should be opened, and a few stones, the size of a wallnut, should be put under each pot to admit the roots to protrude through the hole into the earth in the feeder, which I am confident may be done by this addition, and without any additional room.

Another experiment tried on a single plant gave me reason to infer, that much might be accomplished in a little room. On the 9th of November, I introduced a plant into a pine stove, which very soon developed a fine crop of fruit, and which matured in the first week in March following. After the fruit were gathered, and the wood ripe, I pruned the plant, or rather as I call it, renovated it, and placed it in the open air, in the coldest place possible, where I permitted it to remain until Midsummer, at which time I placed it on the front flue of a vinery, where it made as fine a shoot as I could possibly wish to see in the system of pot culture.

The above circumstance is of much importance to the proprietors of small houses; it will enable them to prolong the fruiting season to almost any extent; for a plant or plants subjected to this process will be inclined to remain torpid very long the succeeding summer. This circumstance is very advantageous to those who attempt to cultivate late grapes in pots, a practice which I think will be adopted to a great extent.

The pot culture is, I think, above all others adapted to gratify the proprietors of small houses, not only by their accommodating produce, but with the gratification they afford in the process of culture. One instance, among many others, I beg to relate. In the first week of April, last year, I received a letter from a gentleman, requesting me to furnish him with a plan for a house in which he proposed to cultivate grapes in pots, and also on the roof, but the vines in the latter situation to be so arranged as not to interfere, at least as little as possible, with those in pots. This house was ready for the reception of the plants by the first of May, at which time he solicited me to send him some plants that would produce fruit the same summer. Having only four young plants, that I could spare, and these by no means strong, I sent them without delay, and to my surprise,

in the month of September, I received a letter of thanks, stating his success, viz. that the four pots of vines had produced 117 fine bunches of grapes. What must have been the gratification of the individual during the summer, in observing their progress through the different stages of growth, and in a house, the foundation of which I can venture to say was not laid before the twelfth of April.

Willersley, March 12th, 1834.

ARTICLE V.

ON WATSON'S BEARDED HYBRID RHUBARB.

BY A. W.

I HAVE several years cultivated this sort of Rhubarb, to the great joy of my young family, who pertinaciously refuse to partake of three other varieties, to which they have access, and who have always given a preference to puddings, tarts, &c. composed of the Rhubarb in question, to those made of the choicest varieties of fruit usually applied to the like purposes. But not only have my family exhibited a predilection for its flavour, for my friends have extended their desires to the possession of its roots, insomuch that I feel a difficulty in keeping up a needful supply. I had possessed this esteemed variety of Rhubarb for some years, and had been frequently interrogated as to its name and other particulars, of which I could give no satisfactory account, until I saw it so lucidly described in the *Register* some months ago, and thereby became acquainted with its name, history, &c. which to me was a source of high gratification.

Then judge of my surprise, at seeing in the last *Register*, page 138, that two other sorts were recommended in preference to Watson's. I forthwith proceeded to a neighbour's garden, at which I knew there was growing Wilmot's, from the seed forwarded last year with the *Register*, and procured a few stalks. I weighed off half a pound, and the like quantity of Watson's, and applied an equal quantity of sugar to each, and of course boiled them down separately. On tasting, my second surprise was greater than the first, for my old favourite was as much superior in flavour and appearance as one thing can well be to another. To the Gigantic, I had not the opportunity of applying the like test. The stalks were plucked on the fourth day of March, grown in an open situation, without any protection, or forcing, my own sort having the advantage of several inches in length.

I regret my first communication should be of a contradictory character, but having satisfactorily ascertained the fact, I feel it a duty to set your readers right, and hope my next paper will be more acceptable and conciliatory.

York, March 6th, 1834.

ARTICLE VI.—ON THE PREMATURE SHRIVELING OF GRAPES IN FORCING-HOUSES.

BY MR. J. D. PARKES, F. H. S., NURSERYMAN, DARTFORD.

A VARIETY of causes have been assigned for that disease in forced grapes, which produces a shriveled appearance in the footstalks of the branches, and also a want of size and colour in the berries; more especially in the Frontignans and muscats. Some consider that it proceeds from the roots being too deep in the ground; others think it is occasioned by the temperature of the earth, in which the root grows (when vines are planted outside of the house) being so much lower than that of the atmosphere within; and some attribute the disease to a want of air.

Having observed that early forced grapes are in general free from this disease, and that it never occurs to grapes grown in the open air; and having found, in a house under my care, that some bunches immediately over a steam pipe were free from it; I have come to the conclusion that the cause is stagnation of cold moist air; and the remedy, the application of artificial heat, to such an extent (even in summer, when the weather is cloudy) as to admit, every warm day, of opening the windows sufficient to occasion a free circulation of air.—*Gardener's Magazine.*

ARTICLE VII.—CLASSIFICATION AND DESCRIPTIONS OF THE DIFFERENT VARIETIES OF THE GARDEN PEA.

BY MR. W. TOWNSEND, NEW CROSS.

I PROMISED some months ago to furnish an account of the different varieties of the Garden Pea (Pisum sativum) but until now no opportunity has occurred. I hope it will not be the less acceptable on account of the long delay. You of course, are aware that my observations have been made during several successive seasons, upon the same kind of soil, each variety having the same kind of treatment and being sown at the same time. It must be observed that those

called *early* and *late* are so named as being the earliest and latest in their respective classes. It will also be necessary to add, that the divisions I have thought expedient to make between dwarf and tall, are that those under four feet high, I have marked as dwarf, and those above that height as tall. Should your readers be desirous of procuring any of the varieties which are not in general cultivation and are here enumerated, I shall be most happy to inform them where such can be obtained.

The Classification which I have considered necessary to make, is as follows:

1. Common Peas,	Dwarf	Early.
		Late.
	Tall	Early.
		Late.
2. Marrow Peas,	Dwarf	Early.
		Late.
	Tall	Early.
		Late.
3. Sugar Peas,	Dwarf	Early.
		Late.
	Tall	Early.
		Late.
4. Grey Peas,	Dwarf	Early.
		Late.
	Tall	Early.
		Late.

Common Peas, Dwarf Early.—1. Bishops Dwarf Prolific.—This variety does not exceed eight or nine inches in height, of strong growth with short joints. Leaves darkish green and rather small. Petioles short, and the tendrils very small. Peduncles long bearing for the most part two flowers. An abundant bearer, and not more than a week later than the early frame, it is undoubtedly the best variety for forcing, and of excellent quality. Pods short, but well filled, dark green and roundish. Seed middling size and white.

2. *Early Dwarf.*—Syn. Pois de Bloi petite—Grows between 18 inches and 2 feet high, rather slender with short joints. Petioles short, with small tendrils. Leaves dark green and small. Peduncles short, bearing two flowers. Pods small, roundish and slightly curved. A good bearer, and middling early. Good quality. Seed very small and white.

Common Peas, Dwarf Late.—3. Spanish Dwarf.—Syn. Early Spanish Dwarf. Knoxes Dwarf. Common Spanish Dwarf. Dwarf crooked sugar Pois eventail. Early Frame Sugar. Dwarf Bog. Grows about eight or nine inches high, strong with short joints;

leaves dark green, and small. Petioles short, and the tendrils strong. Peduncles short and the flowers for the most part in pairs. Pods short, broad, slightly flattened and well filled over. A good bearer of good quality, and comes into use about a fortnight after Bishop's dwarf prolific. Seed rather small and white.

4. *Late Spanish Dwarf.*—Syn. Tresnain de Britagne.—This variety grows between fifteen and eighteen inches high, strong and rather straggling, with very short joints. Leaves dark green and small, similar to those of the Spanish dwarf. Petioles short, and the tendrills small. Peduncles short, bearing two flowers. Pods somewhat larger, otherwise similar to those of the above. A moderate bearer, and comes into use a few days after that variety, which must be considered the best of the two, as this has no particular merit. Seed middling size, white.

5. *Tresnain de Brest.*—This in appearance much resembles the Spanish dwarf, but is fully a fortnight later, coming into use otherwise the same. Seed white, and very small.

6. *Nain de Hollande*—Syn. Nain Latif de Hollande; Sans parchmin nain Latif de Hollande.—Grows between two and three feet high, strong, with very short joints. Leaves middling size, and of a dark green colour. Petioles short, and tendrils rather small. Peduncles short, bearing two flowers, which are very small. Pods large, broad and well filled, of excellent quality. An abundant bearer, and not very late. Seed middling size, and white. If this variety were better known in the English gardens, it certainly would be more extensively cultivated. At present, I believe it is but little (if at all) known in the Seed Shops of the Metropolis.

7. *Blue Prussian.*—Syn. Nain Royal—Nain vert petite.—Fine long podded dwarf. Dwarf blue prussian. Blue union. Early dutch green. Early green. Green prussian.

This is too well known to need any lengthened description, I shall therefore merely say that it is a most abundant bearer, and of excellent quality. Grows between three and four feet high. Seed light blue, middling size.

8. *Blue Imperial.*—Syn. Imperial.—Tall green imperial, dwarf green imperial. Dwarf imperial. Sumatra dwarf blue imperial. New long podded imperial. Nain vert imperial. Sans parchmin vert. Nain vert gros. Scymitar. New dwarf imperial. New improved imperial. Dwarf blue marrow. Dwarf blue prolific. New sabre. Blue sabre. Blue Scymitar. New improved dwarf imperial. Dwarf sabre. Sabre.

This grows between three and four feet high, very strong, with short joints. Leaves middling size, of a dark glaneous greencolour. Petioles long, and the tendrils small, but numerous. Peduncles short, bearing two flowers, which are larger than those of the preceding variety. Pods large dark green, and well filled. An abundant bearer, of excellent quality, and comes into use the same time as the blue Prussian, which is frequently confounded with this, but differs from it materially, the leaves being much larger, and the plant of a much stronger habit; it also continues a much shorter time in bearing; it is frequently done by three or four gatherings, but bears very profusely while it lasts. This may be considered as very advantageous to those who cultivate for the market, affording them an opportunity of clearing the ground, and making room for succeeding crops. Seed, light blue, large, and somewhat flattened.

9. *White Prussian.*---Syn. Dwarf white Prussian. Stowe. Prolific. New Dwarf Norman. White prolific. Poor man's profit. Tall Prussian. New Tewsly. Tweesley Marrow. Wrenches white Union. Dwarf Tewsley. Royal Dwarf. Royal Dwarf Marrow. Royal prolific. White prolific.

Grows about three feet high, slender, with short joints. The leaves and pods are a paler green than those of the Blue Prussian; but are very similar in appearance to that variety. The chief difference, however, is in the colour of the seed, which, in this variety, is white and rather small. An excellent bearer, of good quality, and comes into use at the same time as the Blue Prussian.

10. *Sans parchmin nain ordinaire.*—This variety grows between three and four feet high, very strong, with short joints. Leaves, a dark glaneous green, and small. Petioles short, with large tendrils. Peduncles short, bearing two flowers, which are very small. Pods small roundish, but well filled. It is very prolific, of good quality, and is fit for use a few days before the Blue Prussian. Seed white, middling size.

11. *Common Peas, Tall, Early.*---Early Frame.---Syn. Best early. Earliest frame. True early frame. Early dwarf frame. Superfine early. Earliest dwarf frame. Very early frame. Early May. Young's very early. Early Nicholas. Early dwarf. Dwarf frame. Perkin's early frame. Early pana. Early french. Early Scone. Bates early dwarf Nimble. Pais Barau. Pais Laurant. Early single frame. Master's hotspur. Early one eye'd. Single frame. Double blossomed frame. Double dwarf frame. Mason's double blossomed. Superfine double early. Russel's fine early. Michaux de Hollande. Dwarf Albany. Vertaraenes de Mont ju-

lien. Early hotspur. Golden hotspur. Early Wilson. Early May. Pais le plushatif. Superfine double blossomed frame.

This variety is too well known to need description, therefore it will only be necessary to say, that its average height is between four and five feet; only a moderate bearer, but of excellent quality, and one of the earliest peas in the collection. It is generally sown for the first crop in most gardens, and deservedly so; seed white, middling size. The cause for the immense quantity of names by which this sort is cultivated, I am at a loss to know; but the great emulation there is amongst gardeners in general to excel in the cultivation of early peas, has most probably been the reason why many Seedsmen have substituted names of their own as the earliest variety.

12. *Espue de pois, tres excellent.*---Grows between five and six feet high, rather slender, and the joints very distant. Leaves pale yellowish green, and small. Petioles short, and the tendrils small. Peduncles short, bearing for the most part two flowers, which are rather small. A good bearer, and comes into use a few days after the early frame. Pods rather large, flattened and well filled. Excellent quality. Seed middling size and white. This variety nearly approaches to the sugar peas. It grows rather tall, otherwise it would be a most excellent substitute for the early frame, it being a much better bearer.

13. *Tall Frame.*---This very much resembles the early frame, but is of taller growth, it being between five and six feet high, and the leaves are also smaller. An excellent bearer, of good quality, and but a few days later than that variety. Seed middling size, white. This also would make a good substitute for the early frame.

14. *Early Charlton.*---Syn. Late dwarf. Early sugar frame. Early single frame. Earliest double blossomed. Charlton. Golden Charlton. White Boiling. Common white boiling. Hotspur. Early hotspur. Wrenches early hotspur. Double dwarf hotspur. Early Nicholas hotspur. Golden hotspur. Nimble Taylor. Very fine late garden. Paddington. Essex reading. Brussels early blossomed. Twesley dwarf. Michaux a la rouelle. Michaux precoce. Domine de rouelle.

This is also too well known to need much description. It grows between five and six feet high, rather strong, and the joints very distant. Leaves darkish green and large, petioles short, and the tendrills small. An abundant bearer, of excellent quality, and comes into use about a fortnight after the Early frame, with which variety it is (as will be seen by the synonyms) frequently confounded, but I hope the above description will settle the variety of opinions upon

that subject. Respecting the multiplicity of names by which this variety is known, I can give no other cause than that I have conjectured, as to the Early frame. Seed white, and rather larger than the Early frame.

15. *Michaux ordinaire.*—Grows about the same height as the Early Charlton, but much stronger; the leaves are also much larger and of a thick texture, and dark green colour, joints very distant. Petioles long, and the tendrils very large. Peduncles long, and the flowers large, comes into use a week after the Early Charltons; moderate bearer. Pods large, and somewhat flattened. Seed white and large; this variety has no particular merit, and is therefore scarcely deserving cultivation:

16. *Common Peas, Tall Late*.—Russels.---Grows about five feet high, remarkably strong, branching much, with very short joints. Leaves very large, dark green; petioles very long, bearing large tendrils; peduncles long, with two flowers, which are very large; pods large and broad, but do not fill well, of good quality, but is only a moderate bearer, and one of the latest in the collection. Seed rather large, and occasionally wrinkled, as in Knight's Marrow.

17. *Knoxes Dwarf.*—This grows about five feet high, and is rather slender. Leaves dark green and large; petioles short, and the tendrils small; peduncles very short, bearing for the most part but one flower, though occasionally two, which are very small; pods roundish, small, but well filled, a good bearer. Seed middling size, white.

18. *D'Anveriany.*—This variety much resembles Knox's dwarf in its young state; but is of dwarf growth, and much stronger. Leaves dark green and middling size; petioles short, and the tendrils small, but numerous; peduncles short, and the flowers, which are small, for the most part in pairs; pods rather small and roundish. A moderate bearer, and comes into use a few days later than Knoxes dwarf, of good quality; seed white, rather small.

19. *Eastern Shore.*---Grows about five feet high, slender, and the joints rather short. Leaves darkish green and small; petioles long, the tendrils small but numerous; peduncles short, and the flowers very small; pods rather small, roundish, and well filled. A good bearer, and of good quality, but very late. Seed white, middling size.

20. *Egg Pea.*---Syn. Large Egg. Bean. A strong growing variety, between five and six feet high, branching a little, with short joints. Leaves large, dark green; petioles long, with large tendrils; peduncles short; flowers very small; pods large, broad, and well filled. Only a moderate bearer, and of middling quality. Seed large,

irregularly round, brownish white colour, with a black eye. This is not a very desirable variety to cultivate.

21. *Pearl or Nonsuch.*---Syn. Tall black rouncival.---Clamartow carre feve. Grows between five and six feet high, strong and branching with rather short joints. Leaves middling size, pale green. Petioles short, and the tendrils small. Peduncles short; flowers small, white. Pods small, roundish, and well filled. An abundant bearer, of excellent quality, and very late. Seed rather large, white; a very desirable variety.

22. *Marotta.*—Syn. Black Spotted Marotta. Tall black spotted Marotta. Pearl. Spanish Marotta. Œil Noir.

This variety grows upwards of six feet high, strong and branching, with short joints. Leaves darkish green and large. Petioles long with large tendrils. Peduncles long, bearing for the most part two flowers, which are very large. Pods rather large, and well filled. An excellent bearer, of middling quality, and very late. Seed middling size, dull white, with a black eye. I have no doubt this would be a very desirable kind for field culture. It is rather too course a pea for table.

23. *White Rouncival.*—A very tall late pea growing upwards of seven feet high, strong, branching a little, and short joints. Leaves dark green, very large. Petioles long, with large tendrils. Peduncles short; flowers very large. Pods large, broad, and well filled. Only a moderate bearer, but very late; rather coarse for table. Seed large, white.

24. *Tall blue Imperial.*—Syn. Spanish Patriot. Tall Imperial. New tall Imperial. Blue Union. Green Nonpareil. Tall Prussian. Carre vert gros Normand. Carre vert. Vert gros Normand. Carre vort gros pois vert.

This is a tall very late variety, growing between six and seven feet high, very strong with short joints, and branches much. Leaves very large, pale yellowish green; petioles very long, and the tendrils large and strong; peduncles very short, and the blossoms small in proportion to the habit of the plant. Pods very large, broad, and well filled. A good bearer, and of excellent quality. This is one of the most desirable late sorts to cultivate in the collection. Seed, very large, somewhat flattened, and of a light blue colour.

25. *Royal Oak.*—Syn. American.—Dutch Admiral, grows upwards of six feet high, strong and branching, with short joints. Leaves large dark green; petioles long, with large tendrils; peduncles short, bearing two flowers, which are very small; pods small, round, and well filled. Only a moderate bearer, and rather coarse.

This in appearance somewhat resembles the Marrotta in its growing state, but will be found by the description to be a very distinct variety. Seed large, white.

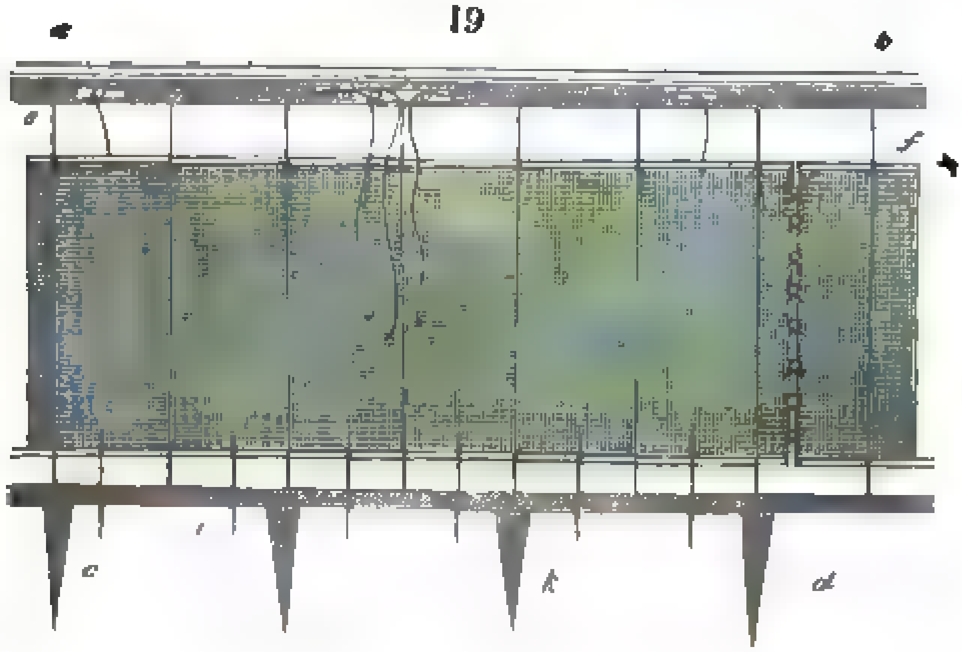
End of Common Peas. The Marrow, Sugar, and Grey Peas will follow in your succeeding numbers.

ARTICLE VIII.—ON SHELTERING WALL TREES.

BY MR. JOHN STEPHEN,
Gardener to W. J. Charlton, Esq., Hesleyside, Northumberland.

After a perusal of your *Horticultural Register*, on preserving Peach Nectarine, and Apricot Trees, while in bloom, from frosts, fogs and cold winds in the months of March, April, and the beginning of May, which are very injurious to them, I can find out no other production than netting. It is a great absurdity to use netting in wet and snowy days, and a hard frost at nights. The foliage is wet in the morning, and the net and trees are frozen so hard that they will break; besides, you cannot always be removing the nets to wash them for the green fly. Now there is a protection that I have used twenty-five years, besides more in the North of England, with great success. It is a thin canvass, which can be purchased at four-pence per yard (yard wide). Six breadths make a covering,

19



Eighteen feet Long.

which I let up and down by ropes and pulleys; if it be a very course day, they remain up all day. If the weather be fine, I let them down in the mornings and draw them up in the evenings; by this means the trees receive the benefit of the sun and free air. If there should

come a heavy hailstorm in the course of the day, I draw them up; a man in the space of twenty minutes will cover one hundred yards of wall; when the storm is over you may let them down, and your trees will be safe and perfectly dry. The framing for the canvass to act upon is made as follows, viz: let the above figure No. 19, *a*, *b*, *c*, *d*, represent the frame, and *e*, *f*, *g*, *h*, the canvass with a top and bottom rail. The top *a*, *b*, under the coping, and the bottom one *c*, *d*, sixteen inches from the wall on the piles drove into the ground level with the border, at four feet distance, and two feet into the ground for the bottom rail to rest upon. The top and bottom railing must be put together by mortise and tenon, the upright ones to be mortised into the top and bottom ones; then being put up under the coping and drove tight on the piles at the bottom to keep firm. The said canvass has lasted twenty-five years, used yearly, and will probably last many more. When the danger of frost is over, I dry the said canvass and roll it up and lay it in a dry place till wanted again. The framing is taking down, laid away to keep dry; if the framing were made of memel timber it would last one hundred years; mine is only made of common spruce fir, and is as good as it was that day it was made. The canvass is laced to rails *e*, *f*, and *h*, *g*, made of foreign white wood, three inches broad, and one inch and a quarter thick, third off to half an inch, on both sides. Then some small holes are put through the broad way, about four inches asunder, to which the said canvass must be laced with strong threefold twine, the same as mariners use to lace their sales.

i, To keep canvass from the ground. *k*, Piles drove into ground.

Hesleyside, March 15, 1834.

ARTICLE IX.

LONDON HORTICULTURAL SOCIETY.

SINCE our last report, papers have been read containing accounts of experiments made in the garden of the society, with a view to ascertain the relative productiveness of the tubers and sets of potatoes, by Dr. Lindley, and hints concerning the culture of melon plants (particularly those of the housainee varieties of the persian families) as aquatic or amphibious plants, by the author of the Domestic Gardener's Manual. The details of the first paper were very much in favour of planting potatoes in sets, that method, in the present course of experiments, having had the advantage very considerably over planting tubers in an entire state.

The following plants were the most prominent in the exhibitions, which have been remarkably good. Magnolia conspicua, Cactus Jenkinson, Camellias reticulata, Rawesiana, &c. Berberis aquifolium, Echeveria gibbiflora, a new species of Berberis, from Chili, Acacia Verticillata, Euphorbia bilabris, Ribes stamineum and sanguineum, Primula verticillata, and a very fine Azalea indica phœnicea. Some handsome collections of apples have also appeared, several of them the contents of boxes sunk in the earth: of these the Boston Russet appeared to have kept better than the other varieties, no specimens of it having decayed.

Cuttings of the Beurre d'aremberg, Forme de Dèlices, Courte de Lamy, Monarch, and of other first rate pears, have been distributed to the assembled members with the usual spring domations of seeds.

ARTICLE X.—HORTICULTURAL CALENDAR.

VEGETABLE DEPARTMENT.

Broccoli.—Plant out the early raised plants two feet apart for heading in autumn, and sow the Siberian to produce heads next May: about the middle, sow Green Cape and Early Purple Cape, and Grange's Early White, to come in from the end of August to Christmas.

Carrots for drawing young in summer, should be sown in the beginning; and towards the end the main crop will require thinning out to about six or eight inches apart; but when they are intended to be drawn in summer as they are wanted for use, only thin to four or five inches.

Cauliflowers.—Hitherto sheltered under hand-glasses must be fully exposed. About the end of the mouth sow some seed for Michælmas and winter crops, and dust the beds with lime to destroy the slugs as soon as the plants make their appearance.

Beets.—Thin the red to ten inches or a foot apart and the green and white to six inches apart.

Celery.—Plant the first sowing in trenches.

Cabbage.—Plant out the spring raised for autumn use; and draw about the stems of the early ones, in the beginning also sow more seed of the Van Ack, &c.

Dwarf Kidney Beans as the Canterbury, cream-coloured, dun-coloured, &c. may now be sown on a warm border, in drills, two feet and a half apart.

Peas and Beans.—Sow once a fortnight for successional crops: also root and earth up such as require it. The beans about the end of the month if the weather be dry may probably begin to be infested with the Aphis; as soon as the insects are perceived at the top of the stems, pinch the tops of those infested off and carry them away and burn them. If in consequence of April being dry the little brown beetle infests the peas, lay some bean stalks or other shelter for them, in the evening some boiling water may be poured over the decoy.

Onions.—Sow a few silver-skinned to draw young in summer, or small bulbs to pickle.

Endive.—Sow, a moderate quantity of the green curled about the twentieth.

Spinach—Sow once a fortnight for successional crops.

Savoys.—Plant out the earliest raised savoys about two feet apart, to form heads for autumn.

Lettuce.—Sow two or three times in the month, and plant early raised ones a foot apart.

Mustard and Cress.—Sow once a week in warm situations.

Turnips.—Sow a plentiful crop of the stone-top towards the middle of the month.

Insects.—Wasps should now as much as possible be destroyed before they begin to breed, as by destroying one at this time of the year, the existence of many hundreds is prevented.

FRUIT DEPARTMENT.

Apricots on the open walls must be examined, and the caterpillers secreted in the buds destroyed, by taking the curled leaves off and crushing them.

Vines in Pots now brought into the vineries, will ripen their fruit by the end of July, and those introduced up the rafters will ripen their fruit in October. They may also be layered any time this month, they do not require either tongueing or twisting; but if the weather is dry they must have a good supply of water.

Peach Trees in houses, if the fruit has finished stoning, keep the heat from 70 to 75 degrees by day, and 65 to 70 by night.

Cherry Trees in houses, will very probably have their fruit now stoning, be careful that the thermometer range no higher than 60 degrees by day and 55 by night, until this critical period is over, when the heat may be raised to 70 degrees by day, and 65 by night. Give abundance of air, and syringe the trees until the fruit begins to ripen, when it must be discontinued.

FLORICULTURE.

ARTICLE XI.—CULTURE OF THE STOVE SPECIES OF CACTUS.

All the stove species of Cactae may be treated as follows:—

Pot them in loam and peat, or sandy loam, mixed with a small portion of lime rubbish, say about a fourth part.

Always let the pots in which they are planted be as small as the plants will allow; large pots are injurious, because the roots are prevented from reaching the sides for so long a time, and the body of soil is liable to retain too much moisture every time the plant is watered.

Always give a good drainage, by laying in each pot a good portion of broken potsherds, as the least stagnation is always injurious, sometimes fatal; therefore, never allow water to stand in the pans or feeders, in which the pots are sometimes placed.

Water very seldom, not more than twice a week, when they are flowering, and not so often at other times; give very little at a time, not more than will just moisten the soil all over, particularly if the weather is not fine and sunny.

About the middle of June, turn them out of doors, into a situation where they will not be exposed to wind, but perfectly open to the rays of the mid-day sun. Place them on a board or floor of any kind, to prevent the worms from effecting an entrance through the bottom of the pots. This system of exposing them in summer, gives them a check which seldom fails to produce a good bloom.

Whilst out of doors, they must be allowed to receive the heavy dashing rains, or they will suffer, perhaps, die in consequence; either a boarded roof or other shelter must be provided for them on such occasions. Also, if the pots stand on a floor of slates or flag stones, they should be partly plunged in a little moss, as the sun, by heating the pots, sometimes burns the roots of the plants.

In September, take the plants into the greenhouse, and place them in a situation where they will receive plenty of light and air during winter.

Early in the spring, remove them into the stove in succession, as they are wanted to flower.

Most of the species will flower very fine without being placed out of doors at all; but by placing them out as above, the flowers will be much finer and more abundant than when grown regularly in the house; they may be increased by cuttings, seeds, and grafting.

Take of the cuttings at the length required, and lay them on a

shelf in the greenhouse, &c. to dry up the wound made by the knife. Let them remain on the shelf until they begin to have a shrivelled appearance, say a week or fortnight, then pot them in small pots in the same compost as recommended for old plants; set them on a shelf as near the glass as convenient, and be particularly cautious not to over-water them.

Sow the seed in the wet state, immediately after being gathered from the plant and rubbed out of the husk. For this purpose, fill a pot with a mixture of equal parts of peat earth and sand, cover it lightly, and plunge the pots in a hotbed; if the seed be good, it will make its appearance in a month afterwards.

The operation of grafting is very simple, merely requiring an incision to be made, and fitting in it a fresh cutting of another kind, rubbing a little clay over the wound to keep out the air.

ARTICLE XII.—CULTURE OF EPACRIDEÆ.

ALL the species of Epacris are natives of the neighbourhood of New South Wales, and are very handsome shrubby greenhouse plants. Their culture is very simple and easy; the E. microphylla and exserta require to be potted in about equal parts of light sandy loam and peat, but all the rest thrive best in sandy peat alone. They nearly all come in flower about the end of March or beginning of April, and continue blooming until June or July, although the present subject flowers most of the winter, as well as spring and summer. In June, they must be turned out of doors with the other greenhouse plants, but previous to which, it will be necessary to pot them, in most cases shifting them into larger pots; this is indispensable, as their roots are of so fine a texture, that if the pots be placed out of doors, and consequently exposed to the alternations of heat and cold more than when in the house, the roots against the sides of the pots will receive material injury, the plants will become brown, and in most cases die; this we have seen in very many instances.

The best way of propagating them is by cuttings, which should be put in early in the spring; they will strike if put in at other times of the year, but not so freely. Take off the extreme ends, about one inch or an inch and a half long, and plant them in pots of sand, cover them with bell-glasses, and give them a similar treatment to Erica cuttings. When they have struck root, pot them into small pots filled with sandy peat, and place the pots in a frame where there is a little heat; and when they have again begun to grow, remove

them into a warm part of the greenhouse, and treat them in the same way as the old plants. The whole of the order Epacrideæ, consisting of eighteen genera, all being natives of the same country, require the same general mode of culture, which may be stated as follows:—

With the exception of Epacris microphylla and exserta, Styphelia longifolia, the whole genera of Lysinema, Ponceletia, and Leucopogon, let every species be potted in sandy peat soil.

The above exceptions must always have an addition of sandy loam mixed with the peat in which they are potted, but in every other respect they must be treated like the other species.

Good drainage in every case must be attended to, for any deficiency here will seriously injure, if not totally destroy the plants.

Never sift the soil in which the plants are potted, but chop and break it well, although in some cases this is scarcely necessary, when the turfy parts are well rotted.

Never allow the soil to become hard and dry, particularly amongst those species potted in sandy peat alone; because, from the delicacy of the fibres of the roots, this cannot be the case without the plants being materially damaged, if not destroyed.

Always pot the plants immediately before they are turned out of doors, in the summer; for if this be not done, the action of the sun and air upon the sides of the pot, if the roots are matted, will dry the roots, and the plants will become sickly and die.

In potting, never cut off the matted roots with a knife, but merely pull them with the fingers, without damaging the ball more than is necessary.

Always let the plants stand in an airy part of the greenhouse, and never crowd them amongst other plants, or they will not prosper.

In propagating, select half-ripened wood for cuttings, plant them in sand, cover them with a bell-glass, and place them in a shady part of the greenhouse, or in a frame. In both situations they must be shaded from the sun, until they have struck root.

ARTICLE XIII.

NOTE ON THE CULTURE OF IXIÆ AND GLADIOLI,

BY MR. T. RUTGER.

Feeling dissatisfied with what I had seen of the flowering of these bulbs, in the nurseries round London, as well as with those under my own care, I resolved to try the effect of a different soil from that generally recommended, and not cramming so many of them to-

gether in a pot as is usually done. The soil used was one half rich loam, with one-fourth rotten dung, and one-fourth leaf-mould, both well decomposed and mixed up together with the loam. The pots were well drained, and a layer of the siftings of the dung and leaf-mould was put over the drainings. Of the smaller sorts of bulbs, I put only two or three in a forty-eight sized pot; of the larger only one in a pot of the same size; and of the largest only one in a thirty-two sized pot. During their growth; and particularly when near flowering, the bulbs were liberally supplied with water. Under this mode of treatment, my desires were fully realised, and my bulbs produced fine flowers, far superior to any others that I have ever seen grown in pots.—*Gardeners' Magazine.*

ARTICLE XIV.—COAL-CINDERS AS DRAINAGE FOR POTS.

BY MR. H. TURNER,

Curator of the Botanic Garden, Bury St. Edmonds.

EARLY in May, 1833, I potted the following twenty species of plants, using cinders instead of potsherds. The plants being duly marked, were placed among others in the collection, and they received the same attention as the other plants, which were drained in the usual manner. In the beginning of October, I examined the plants drained with coal-cinders, and found them in the following state: —

Number and Names of the Plants.	*State in which they were found.* Dead.	Sickly.	Healthy.
4 Delphinium sinense	3	1	0
2 Cirsium afrum	2	0	0
4 Silene maritima	2	1	1
2 Silene maritima flore-pleno	2	0	0
2 Soldanella alpina	2	0	0
4 Papaver orientale	3	0	1
2 Lythrum alatum	0	0	2
2 Erythrolæna conspicua	2	0	0
2 Erigeron glabellus	1	1	0
2 —— purpureus	1	1	0
2 Phlox tardiflora	2	0	0
2 ... crassifolia	1	1	0
4 ... lubulata	0	1	3
2 Œnothera macrocarpa	2	0	0
2 —— missouriensis	2	0	0

2 Œnothera acaulis	0	0	2
2 —— speciosa	0	2	0
2 Pyrethrum inodorum flore-pleno.	0	1	0
4 Asclepias bombacina	3	1	0
2 Clematis Viorna	0	0	2

It will be perceived that, out of fifty plants, twenty-eight died, and ten were so sickly that I threw them away: twelve only remained in a healthy state.

Cinders or coal-ashes are also injurious to some plants, when the pots containing them are plunged in the coal-ashes, as it will appear by the following fact:—The varieties of Chrysanthemum sinense, which were cultivated in this garden in 1832, were plunged about two inches below the rims of their pots, at the base of a south wall, for flowering. After flowering (late in November) they were taken up with their roots hanging in all directions over the pots, and plunged in a two-light frame, one division of which was filled with cinder-ashes, and the other with common garden soil. In March, 1833, the whole of those plunged in the ashes were pale and sickly, while those plunged in the soil were all robust and healthy; thus proving that coal-ashes, as well as cinders, are detrimental to some plants.---*Gard. Mag.*

ARTICLE XV.—CULTURE OF IPOMOPSIS ELEGANS.

This beautiful plant is a native of the North-west coast of America, whence it was introduced to the garden of the "Horticultural Society," by Mr. Douglas, in 1827.

Whether it is naturally a perennial is uncertain, it seldom survives two years with us, being very impatient of cultivation. We have seen individual plants of it thrive and flower beautifully, whilst their neighbours of the same sowing, and apparently experiencing the same treatment, have fallen over just above the ground when about to flower, without any apparent cause. Not being able to define the cause, we remain incapable of prescribing a certain remedy for this sudden loss. We merely state, that we have succeeded very well by sowing the seeds in autumn, thus allowing the young plants sufficient time to get strong, before they shew a tendency to flower, for if they shew flower whilst the plants are weakly, they are almost sure to perish.

They seem to be impatient of glaring sunshine, to obviate which we have planted them upon a north border in peat earth, but they

did not thrive well in that situation and soil. This might have been partly occasioned by the wetness of the season, but we apprehend not altogether, as Mr. Lindley states, in the Botanical Register, folio 1281, that "the plant will not live in either peat or light soil."

The best method we know of, is to plant them in a cold, damp soil, under either an eastern or western wall, where they will at least be shaded more than half the day.

There is scarcely any plant appears more beautiful or graceful when flowering in the greenhouse, or conservatory, than this does. For this purpose, we would recommend them to be grown in a cool airy frame; they do not like to be often disturbed at the roots, so when the plants have become pretty strong, place them at once in the pots intended for flowering. The sized pots for this purpose are about ten inches wide at top, and twelve inches deep. Fill these with a free loamy soil, and allow each plant to stand high in the centre of the pot, as recommended by Mr. Mc.Nab, Vol. 1, p. 456. With this treatment they will produce seeds, by which they are increased.

The genera Ipomopsis and Gilia bear a very close affinity with each other, particularly in the present subject, and the G. coronopifolia; but the former is covered with more downiness than the latter, and in the latter the segments of the corolla are somewhat narrower. There are, however, some doubts entertained relative to the propriety of separating it from Gilia, and therefore M. D. Don has given it the name of Gilia aggregata, in Sweet's British Flower Garden, t. 218, N. S. The generic name is derived from Ipo, to strike forcibly, and opsis, sight, alluding to the dazzling appearance of the flowers; and the specific name elegans, from the elegant and graceful manner of its growth.

The annual species of Gilia may be sown in the open border, and require the common care of other hardy annuals; and the biennial species should be raised on a hotbed or in the stove, and when potted off, they should be kept amongst the greenhouse plants.

ARTICLE XVI.—CULTURE OF MIMULUS ROSEUS.

THIS is a very beautiful species; indeed with the exception of the two varieties of rivularis, viz: Smithii and Youngii, it may be stated as the handsomest mimulus cultivated. Mr. Douglas sent seeds of it, in 1831, from North California, to the Horticultural Society of London, in whose garden it flowered the following summer, and was

figured by Dr. Lindley in his excellent Botanical Register, folio 1591.

It is a perennial, and seems scarcely so easy of culture as the generality of this genus. The best way is to keep it constantly either in a frame or greenhouse, potted in light loam, and the pot placed in a pan of water. It will, however, grow and flower in the open borders, during summer, but in this case its flowers are very small, and afford very little ornament, and it is indispensable to shelter it in winter either in a greenhouse or frame. It is increased by cuttings, and occasionally it ripens seeds. A strong musky odour is emitted by it, similar to that of the moschatus. All the species of mimulus are remarkable for the irritability of the stigma; the two lobes lie rather wide of each other when not irritated; but if touched slightly with a needle, a straw, or a bristle, they instantly close.

The annual species, as floribundus and parviflorus, are raised easily from seeds, which may be sown in April, in a warm situation in the open boarder in common soil; but they grow stronger if the soil be peat. As soon as they are large enough, thin them carefully out, or they are liable to damp off.

The hardy perennial species and varieties, as the moschatus, luteus, luteus rivularis, alatus, &c., are easily increased by division of the roots and seeds. The moschatus thrives much the best, if planted in a shady damp border of peat soil. In such a situation the leaves and flowers will grow remarkably strong; but, it will grow in almost any soil or situation, and gives out a powerful musky odour. The luteus, and the variety rivularus, spread rapidly, if planted by the side of a pond of water, particularly the latter; they both succeed admirably in pots kept standing in water. With this treatment the leaves and stems of the rivularis assume a brown colour, and the rich brown spot is very conspicuous. Both the luteus and rivularis seed freely; if the seeds be sown in spring, the plants will flower in the autumn, and if in autumn, they will flower the following summer. If placed in a hothouse, the colours are paler, and less beautiful although the plant itself grows taller than under any other treatment.

Those requiring the shelter of a frame in winter, as the guttatus and lanatus, require similar treatment to the greenhouse species.

The greenhouse species and varieties, as the glutinosus which is now nearly lost in our greenhouses, the variegatus, Smithii, and Youngii, will do in almost any rich light, and porous soil; but the pots in which they are planted should be placed in pans filled with water. We raised a very beautiful variety from seed bearing some

resemblance to Smithii, but with a marked difference in its spotting.

The word Mimulus is derived from mimo, an ape; whether this idea of an ape or monkey was suggested by the shape of the flower or the appearance of the seed, is uncertain; probably it was the former; roseus originates in the colour of the flowers, being rosy pink.

ARTICLE XVII.—NEW AND RARE PLANTS,

FIGURED IN THE PERIODICALS.

CLASS I.—PLANTS WITH TWO COTYLEDONES.

SCROPHULARINÆ.

LINARIA CIRCINATA, Curve-leaved Toad-Flax. This curious species was raised by Mr. Anderson, from seeds stated to have come from Buenos Ayres, but it seems more probable that it is a native of Northern Africa, as most of the species of the section of the genus to which it clearly belongs, are natives of that country. The flowers are yellow, and larger than those of L. vulgaris, the plant is apparently somewhat shrubby. It requires a light loamy soil, and may readily be increased by cuttings. It will require to be protected in a pit during winter.—*Sw. Fl. Gard.*

APOCYNEÆ.

ALYXIA DAPHNOIDES, Daphne-like Alyxia. A shrub of strong growth, inhabiting dry shaded woods, on Norfolk Island. Living plants of this distinct species were introduced to the Royal Gardens by Mr. Cunningham, in 1831. It bears small white flowers, and is remarkably hardy, simply requiring protection from frost, and is readily propagated by cuttings.—*Curt. Bot. Mag.*

ECHITES STELLARIS, Star-flowered Echites. A tender stove climber, introduced from Rio Janeiro to the Horticultural Society, by the Hon. Robt. Gordon. In the month of August, its flowers perfume the part of the hothouse in which it is placed, with a delightful smell of primroses. The plant grows readily in peat and loam, but is scarcely to be propagated except by cuttings of the root. The specific name is given in reference to the coloured eye of the corolla, which, being deep rosy red in the centre, with fine starry lobes, bordered with a sort of orange-yellow, gives a striking appearance to the flowers.—*Bot. Register.*

CONVOLVULACEÆ.

IPOMÆA HORSFALLIÆ.—A tender twining evergreen with handsome flowers, of a deep rich and glossy rose-colour, equally dark

within and without. The seeds were received by Charles Horsfall, Esq. either from Africa or from the East Indies, and raised by his very skilful gardener, Mr. Henry Evans, at Everton.—*Curt. Bot. Mag.*

CRUCIFERÆ.

STREPTANTHUS OBTUSIFOLIUS, Blunt-leaved Streptanthus. A little plant bearing rose-coloured flowers. It will no doubt bear the open air of our climate.---*Bot. Mag.*

CLASS II.—PLANTS WITH ONLY ONE COTYLEDON.

ORCHIDEÆ.

CATASETUM LURIDUM, Lurid Catasetum. After having been imported into Prussia, some years since, and been apparently lost, this rare plant has suddenly made its appearance, almost at the very same time, in several collections. It is a native of the woods, not only of Bahia, but probably of the greater part of Brazil, the Prussian specimens and those of the Horticultural Society having been imported from Rio Janeiro. Like all the species with similar habits, it grows freely in decayed vegetable matter, mixed with a little pure loam, among quantities of potsherds, and it probably will soon become common. Although it cannot be compared for beauty with Catasetum tridentatum, it is nevertheless a very interesting species; the spots on the margin of the lip are of the deepest and richest ruddy-brown; while the horns of the column may be compared to the forelegs of some spider lurking in the bosom of the flower, to seize upon the victims that may enter it.—*Botan. Register.*

ORNITHIDIUM ALBUM, White Ornithidium. This curious plant is a native of Trinidad, whence it was sent to the Glasgow Botanic Garden, by Mr. David Lockhart, where it flowered in November, 1833.—*Botan. Magazine.*

AROIDEÆ.

CALADIUM FRAGRANTISSIMUM, Delicious-Ascented Caladium.—Among other plants which invest the stems of trees in the forests of the tropics, the different species of Caladium constituted a striking feature, both in regard to form and colour. The flower is partly tinged with red, and yields a fragrance similar to the Olea fragrans, but more powerful. It has lately been introduced to the Liverpool Botanic Garden, from Demarara, by C. S. Parker, Esq. It requires the stove.---*Bot. Mag.*

LILIACEÆ.

CYCLOBOTHRA ALBA, White Cyclobothra. A Californian bulbous plant, introduced by the Horticultural Society, in whose transactions it has recently been published by Mr. Bentham. Along

with the following species, and some other plants from the same country, it forms quite a new class of Horticultural objects, of great interest; representing, at Midsummer, which is their time of flowering, the Fritillaries and Tulips of the spring. They are probably quite as hardy as Tulips, like which they should be treated, unless it should prove that their bulbs are capable of living all the year round in the open ground. In the garden of the Horticultural Society, they have been planted in the open border, in a light loamy soil, in a cold frame, where they grew with considerable vigour, flowered beautifully, and produced abundance of seed.---*Bot. Reg.*

CYCLOBOTHRA PULCHELLA, Deep Yellow Cyclobothra. We doubt whether this plant likes the climate of England so well as the last.---*Bot. Reg.*

ARTICLE XVIII.—FLORICULTURAL CALENDAR.

Auriculas must be carefully preserved from slugs and caterpillars this month; and about the end of the month when they are quite out of flower pot them. Those plants intended to produce seed instead of being potted must be placed under a south wall, and have a good supply of water until the seed is ripe.

Biennials raised on hotbeds should be planted in the open borders or in pots, about the end of the month.

Cactae.—Watered carefully and treated, as recommended.

Camellias being now in a growing state will require a temperature from 65 to 70 degrees by day, and from 55 to 60 by night, if about the end they have perfected their young shoots, immediately raise the heat to 80 or 85 degrees by day, and 70 or 75 degrees by night, to assist the formation of flower buds.

Carnation.—Seed should be shaken out of the capsule and sown about the middle of the month in pans or pots, of light soil, and the seed must be very lightly covered.

Chrysanthemum indicum.—Pot the best suckers in small sixty-sized pots, for flowering plants next season.

Dahlias.—Plant out seedlings, and turn out those forwarded in pots into the open borders about the end.

Erica Cuttings continue to put in, as recommended last month, and as stated Vols. 1 and 2.

Ipomopsis elegans should be planted in a cold damp soil under either an eastern or western wall, about the end of the month, and others may be kept in pots to flower in the conservatory.

Mimulus.—The annual species, as *floribundus, &c.* should be thinned out, or they are liable to damp off.

Passiflora kermesina and other species, may be propagated by cuttings in the beginning of the month.

Ranunculuses now planted will flower in August.

Rose Trees.—Cuttings of the China and its varieties will strike well, if put in early in the month under a hand-glass, or a somewhat shady border in light soil. The Common Roses which were left unpruned to obtain late flowers, should now have their old wood cut back below, when the young shoots have pushed, and the lower buds will push anew and produce flowers very late.

Violets.—This is the best time to make new beds of violets, by planting the runners.

ARBORICULTURE.

ARTICLE XIX.—PLANTING FOREST-TREES IN HIGH SITUATIONS, WHERE THEY ARE MUCH EXPOSED TO THE SUN.

BY GEORGE STAFFORD.

It always gave me considerable trouble of mind to see so many plants perish in these situations in the first, second, and third years after planting. Having, in the early part of my life, been very extensively employed in planting in similar situations, and at a period when the mania for shallow planting was little known, I beg to add a few remarks on the subject, being at the same time well aware that some will go far enough to call it *Idiotism.*

The practice, at the period stated, was to prepare the holes either in the autumn or some time previous to putting in the plants, at which time a precaution was always taken to put the plant deep enough in the hole to insure it a sufficient covering of earth above the principal roots, in case of dry weather in spring or summer, by which precaution very few plants failed, but were kept sufficiently moist through the summer. To ensure success, of course the best and most proper earth should be selected to come in contact with the roots, and that of a more crude nature laid on the surface. In these refined days this would be termed erroneous; but find me one tree of any species that has either been planted by nature or man, which has not corrected itself in this respect.

If we examine a whole forest containing all the known species in this country, we shall find that the very principal roots have been raised by their own efforts from two to three feet in height, and those

roots that were at one time six or seven inches below the surface are now a considerable height above the ground. I am of opinion, that were the plants, which are planted in the situations before named, put a few inches deeper, the success in planting would be equal to what it was forty years ago, and the nurserymen would not be called upon so repeatedly to replant and fill up as they now so frequently are. Should the plants survive, after being planted in this manner, it requires a lapse of years before they are established, and usually they become stunted, in which state they often continue through their lives. But if planted at a sufficient depth to ensure the growth of the plants, and should it be rather more than is considered to be the standard, they will assuredly make an effort to correct themselves, and those very roots which caused the doubts will very soon appear on the surface, as explained in the annexed diagram, and in situations where the under stratum is rocky, a tree will afterwards be raised from its original position many feet. How can we perform the operation in a worse and more absurd manner, on one of the high situations, than by putting a plant in so shallow as barely to cover the roots? how is the plant to survive, should the ensuing season be below the average in point of drought? From experience, we know that a few inches of additional earth will ensure success, and from experience we know likewise, that if the plant survives, the roots will approach the surface.

Whoever will take the trouble to examine a number of trees, will, I am certain, nurture the hypothesis I have advanced, and come to the opinion, that it is more advisable to plant deep enough to ensure the life of the plant, and not to be led into an error by shallow planting, in situations where a contrary practice is to be preferred.

20

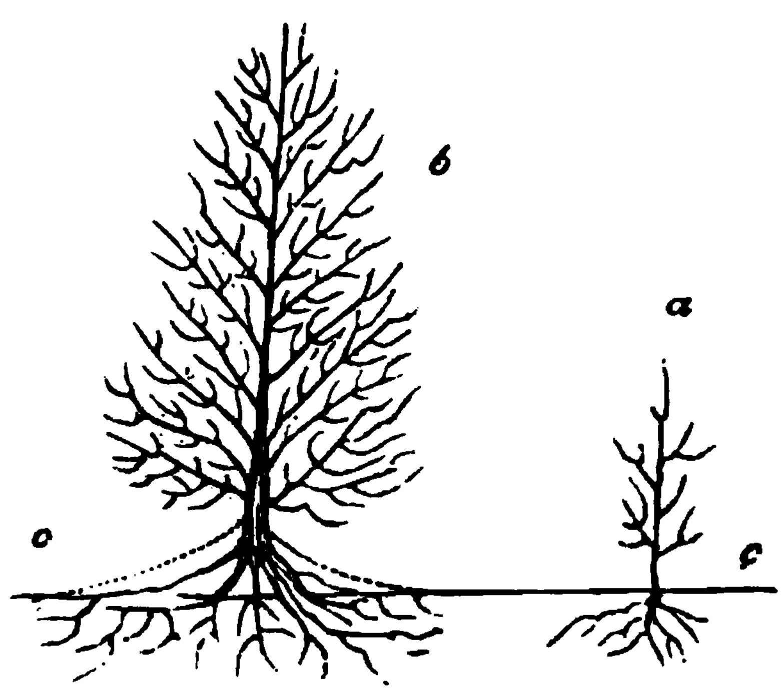


Figure 20, (*a*) represents a tree planted six inches under the surface forty years ago; (*b*) is the same tree with the fine principal roots acting as props to the stem, which they have elevated two feet above the ground level, as marked (*c*). Now as this is the case eighty times out of ninety, what have we to fear, should the young plants be inserted a few inches deeper into the

earth than the dictated mark? From experience, I can prove at this time, from trees at the planting of which I was present, that every species of tree will do better when planted a sufficient depth; and from the observations I have made, and from what I have been able to select, I am confident that the success of planting was better, years back, than at the present time.

We are very apt to run to extremes, and when the first novelty is over, another search is made, which generally terminates in any thing but a practice founded on experience. I am aware, that many will widely differ in opinion from me on this subject, but I refer them to the first tree they may meet with of any size, which will afford a rationale to the argument.

We may calculate, if these rules are followed, that a burden will be removed from the shoulders of many nurserymen, which they have been undeservedly obliged to bear for the last thirty years, without the least hopes of ever escaping from its weight, by the serious losses in planting being referred to a right cause.

If proofs are wanting of the utility of deeper planting, I need travel no further than the plantations at Willersley, which were all performed in the manner recommended, and which excel in extent and elevation those of any other proprietor in this part of the country. I am also prepared to prove, that the success was excellent, indeed beyond expectation, for although it was a constant practice for many years to plant upwards of fifty thousand trees annually, upon as high ground as almost any in Derbyshire, such was the success, that the individual who superintended the planting for the last forty years, is ready to attest, that scarcely a plant has been known to fail.

From the position in which the roots now lie, and from the progress the trees have made, added to situation and quality of earth, there is good reasons for recommending a similar practice to be pursued in other and similar situations. I also think there is just ground for condemning the system of shallow planting. I would advise all who feel prejudiced in favour of the latter, to examine any tree which has been growing twenty, thirty, or forty years, and then I think it will be inferred, that in no case does nature exert herself more than in the disposition and arrangement of the roots of forest trees. Gardeners all know what prodigious progress the roots of trees annually make in their heaps of compost. I find at this place, that their annual progress is as much as five feet in a heap of compost, and I have good reason to believe, that their growth would be double, if the soil was suitable for them.

I have been a planter now forty years, and always gave this short direction:—Make the holes in the autumn, deep and wide, cut the turf small, and when the plants are put into the holes, put a portion of the best earth under and above the roots, cover in the top with the coarsest parts of the soil, which acts almost like a mulching in dry weather, and ensures the life of the tree to a certainty.

ARTICLE XX.

PROPAGATION AND CULTURE OF COMMON LAURELS,

BY MR. JAMES BROWN, JUN.

MANY persons who have visited the pleasure-gardens at Stowe, have much admired the common Laurel, growing so luxuriantly in every direction, and have been highly gratified at the ornamental beauty displayed by this plant; in regard to the gardening scenery, when on an extensive scale.

The Laurel is valuable as an evergreen shrub, which makes it a favourite at all seasons of the year; as well because it is excelled by none as an undergrowth; and on account of the facility with which it is propagated, either by cuttings, layers, or seeds.

But the following method is pursued in propagating them in the gardens of Stowe, the different shrubberies are layered down at certain periods, similar to the manner in which the copse woods are cut; but some of these are done annually, and in the course of seven or eight years, the whole of them are completed; that being about the time of their duration in perfection.

In the first place, the quarter is cleared of all useless growth that has sprung up in the interior; some of the main stems of the Laurels are thinned out, as there are in general more than are required for layering down. From the superfluous stem, pegs are made for securing the remainder when laid down, which is effected by commencing on the side or end of the shrubbery and letting them into the ground, so as to be hidden and at proper distances; to admit all the young branches to be layered around them for the future plants. But to accomplish this, the greater part of the main stems require cutting near the ground, in order to bend them some three-fourths of their diameter, as this will not in the least deteriorate the young layers from growing, provided the sap can pass the incision just to keep the branch alive. The young branches are then laid in about two feet apart, by taking a spit of earth out, twisting the branch, replacing the spit of soil on it, and shortening the shoot according to its strength.

The great advantage derived from this practice is the renewing of the plantation, and the producing of an extra supply of young plants. The half or more may be taken up in the course of two or three years, and planted elsewhere, as circumstances require, thus saving the trouble of propagating by cuttings, which are three years in making strong plants for removing, and seedlings will take a longer time to establish themselves well.

Some of the shrubberies at Stowe, we find it impossible to lay, as the ground is completely filled with old branches, from having been repeatedly done. These are quite cut down, and left to shoot out again, and soon make fine plantations; many plants may also be procured from the long branches of the old ones, which have been bent down to the ground in the winter by snow, or other accidental causes, and have taken root.

When the larger shrubberies are layered, it is the proper time for felling any timber that wants, or planting vacancies, and such like; pruning also should be duly attended to, which saves unnecessary work when done at this time.

The Laurel requires a dry subsoil, but on cold and wet clay situations it will not thrive, and it is a great folly to plant such with young plants. Strong ones, from five to six years old, are the best in such cases, but the most proper soil is a gravelly loam, on a dry subsoil of which the gardens of Stowe nearly consists, and is no doubt the cause of the success attending them.

Stowe Gardens, Feb. 1834.

REVIEW.

ARTICLE XXI.—USES OF THE THINNINGS OF LARCH PLANTATIONS.

An Extract made on Reviewing the Ninth Edition of Miller's Gardeners' Dictionary, containing the best and newest methods of Cultivating and Improving the Kitchen, Fruit, and Flower-Garden, and Nursery; as also for performing the Practical Parts of Agriculture, including the Managing of Vineyards with the methods of Making and Preserving Wines, according to the Practice of the most skilful Vignerons in the several Wine Countries in Europe. Together with Directions for Propagating and Improving, from real Practice and Experience, all sorts of Timber Trees.

In Four Volumes.—Monthly Numbers, 1s.

Two Editions of this Work have been announced; the present is the only one which has yet appeared. The practice of publishing

new Editions of standard works, the persons being unknown by whom they are conducted, and on whose judgment the public are called upon to depend, is not good.

The printing and engravings in this Edition, as it regards workmanship, are very well executed, and with a few alterations the work is likely to become useful. Each number contains forty-eight pages of letter-press, and four copper-plate engravings, for one shilling, which is cheap enough.

The first two plates in the first number consist of cones of the different species of firs; the third contains figures of a larch, a silver fir, a cedar, and a Norway spruce, intended to illustrate four divisions in an article on the Genus Abies: the fourth contains twenty-four species of Acacia neatly engraved. But there is evidently a very great deficiency in the references to these plates; and to any person unacquainted with the plants, this is very important. We always prefer, if possible, having the names of the various plants affixed immediately under the subjects, as well as to give references to them in the matter; this plan we see is partly followed in the succeeding numbers. The matter upon the whole is very good, although the first number has clearly been got up in a hurry. In future numbers, if some little alterations be attended to, we are persuaded the work will be found well deserving the patronage of the public.

LARCH.—"The thinnings of a plantation of larch may be applied to a variety of useful purposes, whilst they are yet of a small size. In six, eight, or ten years, according to the soil and circumstances, the trees will have attained a size sufficient to be made into hayrakes. They grow so straight, and the wood is so light strong and durable, as to be particularly calculated for this purpose; and, from its shrinking less than any other wood, these rakes will remain longer firm than those made from any other. About two feet, cut off from the root end, will form the rake head, and five feet above that, with a very little taken off from the thickness of the under part will form the handle. No wood is more proper for the teeth of the rake than the red wood of the older trees, because it is not only tough, but little liable either to split or to shrink. Nothing is so fit for shafts to hoes, for it is nearly as strong, and much more durable than ash. Handles for brushes, brooms, scythes, &c. would occasion a vast consumption of these small spars. Light neat, and yet strong chairs, for rush bottoms, might be made of larch wood at this age. Nothing will answer better for hop-poles, for one set of these would outlast two or three sets of ash. Hurdles, spars, and gates, may be made of it, both lighter and more durable than of any other wood; and, when

the trees are of a size sufficient, they may be split down for cart shafts; and in mining countries, they might be employed as posts for supporting the roofs of the mines. The small tops cut off in making these various works, would furnish a neat, elegant, cheap, and durable kind of railing, to be put upon the top of low walls, especially for preventing sheep from over-leaping them. One end might be let into the coping, whether of sod, clay, or lime, and the other end received into a slip of sawn larch-wood, with holes bored through to receive their points. From the straightness of the wood, this kind of rail would be very neat without much expense. In the same manner hen-coops, crates for packing glass, &c. might be made of this material.

But one of the most extensive and beneficial uses of this kind of small wood, is for the purpose of inclosing. These spars, when the root is thick enough, may be slit up the middle by a saw, and cut into lengths of five or six feet; or, if smaller, they may be employed whole. As they are always straight, and nearly of an uniform thickness, if driven into the ground in rows, at the distance of a few inches from each other, with the split sides all one way, they would make one of the neatest and most complete fences that can be seen. The tops of these uprights might be received into a piece of sawed plank, with holes bored in it for that purpose; and supported at due distances by sloping pieces reaching from the ground to the top.

These are a few of the uses to which the small spars from the first thinnings of the plantations might be applied. As they advance to a larger size, for windows, joists, flooring, panneling, couples, rafters, and every other purpose in building, they would be superior to any other kind of wood hitherto employed. There is not a branch or a twig of the larch, that might not be put to some useful purpose. The larger branches might be employed in fencing, and the smaller brush for filling drains, and for fuel. In drains, it is more durable than any other wood; and though the timber will not burn readily, yet the brush is found to make a fire almost equal to the billets of many other trees.

Dr. Anderson has adduced a variety of satisfactory instances and experiments, from which the durability of this wood is established beyond a doubt, even in the early periods of its growth. Nor is this its only good quality, for, when made into planks, there are incontestible proofs of its neither shrinking nor warping, and its having been found unattacked by the worm, during the course of several ages; it is not yet known whether larch wood is capable of resisting the sea worm. Dr. Anderson proposes to ascertain this, by sinking

a piece of sound, well ripened larch wood, with another piece of sound oak wood, in the river Medway, at Rochester Bridge, where it is well known that every other kind of wood is very soon perforated by the sea worm. In addition to the other valuable properties of this tree, Mr. White has communicated to the Society of Arts, the result of some experiments decisive of the use of its bark in tanning. While some of his workmen were taking off the bark from a number of larch trees, intended for building, they found the nails of their fingers stained, which induced him to try whether it would tan leather or not. He procured two calf skins, of equal price, weight, and substance, and immersed one in an infusion of oak bark of very fine quality, and the other in the same proportion of larch bark, from a very small tree, each skin remaining exactly the same time in its respective tan-pit; and, during the operation, he repeatedly weighed a measure of larch liquor against the oak, and always found the former to preponderate; the consequence was, that the skin tanned with larch, felt thicker in the hand and heavier, and was finer in the grain, and of a lighter colour, than that tanned with oak. For this communication, Mr. White was presented by the Society of Arts with a gold medal, in the year 1813. See their Trans. Vol. xxi, for that year. It is proper also to observe, that Mr. White's father had received nine gold and two silver medals from the same society, for planting those trees, which the son is now converting to so valuable a purpose. The resinous juice of the larch tree is the turpentine of commerce. It issues spontaneously from the bark, but is more commonly obtained by boring a hole with an auger, about two feet above the ground, till it reaches near to the heart of the tree; into this hole is inserted a small pipe or cock, through which the turpentine flows into proper vessels placed for its reception. This process is continued from the end of May to the end of September. When the trees will yield no more for that season, the turpentine is pressed through a cloth to purify it. This is usually thinner than any of the other sorts, of a clear whitish or pale yellowish colour, a hot, pungent, bitterish, disagreeable taste, and a strong smell, without any of the aromatic flavour of the Chian or Cyprus turpentine, obtained from the Pistacia Terebinthus. The common and Strasburgh turpentines are from the Pinus Picea; but the Canada balsam, which may be considered as the purest of the turpentines, is procured from the balm of gilead and silver firs.

The turpentine is not to be obtained in considerable quantities from very young trees, and in very old ones it gradually dries up, ill at last it affords none; it is only after the tree has obtained the

thickness of ten or twelve inches in diameter, that it is worth while to collect the turpentine; and from that time for forty or fifty years, if it continue so long in vigorous growth, the tree will continue to yield annually from seven to eight pounds of turpentine.

All the turpentines totally dissolve in rectified spirit, they become miscible with water into a milky liquor, by the mediations of the yolk or white of an egg, and more elegantly by mucilages. Distilled with water, they yield a subtile penetrating essential oil, vulgarly called spirit of turpentine, a yellow or blackish resin remaining in the still which is the common resin of the shops. The essential oil, on being distilled in a retort, becomes more subtile and in this state is ethereal oil of turpentine.

The turpentines stimulate the first passages, and prove laxative; and we are told by Dr. Cullen, that half an ounce of Venice turpentine, triturated with the yolk of an egg, and diffused in water, may be employed in the form of an injection, as the most certain laxative in colics, and other cases of obstinate costiveness. When turpentine is carried into the blood vessels, it stimulates the whole system; hence its use in chronic rheumatism and paralysis. It readily passes off by urine, which it imbues with a peculiar odour; also by perspiration, and probably by exhalation from the lungs; and to these various effects are to be ascribed the virtues it may possess in gravelly complaints, scurvy, and pulmonic disorders. In all these diseases, however, and especially the last, this medicine, as well as some of the gums and balsams of the terebinthinate kind, by acting as stimulants, are often productive of mischief, as was first observed by Boerhaave, and since by Fothergill.

The essential oil, in which the virtues of turpentine reside, is not only preferred for external use, as a rubifacient, &c. but also internally as a diuretic; and by Pitcairne and Cheyne, as a remedy for the sciatica; but few stomachs are able to bear it in the doses they direct. Turpentine, so much used formerly as a digestive application, is in modern surgery, almost wholly exploded.

Besides this well known product, the Larch yields also a manna and a gum. The manna is found in the south of France, and is called the *Manne de Briancon*; it is white, concrete, and sweet, like fine new honey. It is rare, and met with only in small drops, so that it would be very difficult to collect a pound of it. The drops are more or less hard, and adhere to the leaves. Mons. Villars having made some enquiries relative to this substance, with Mons. Guettard, in the year 1773, found it at sun rise almost fluid, and picked up drops of it on the turf, exactly like those which remained

on the trees; but they have not given any analysis or further account of it, except that the season of 1773 was less productive of manna than usual. Pallas informs us, that they have this manna in the Russian empire, but that it is rarely found concrete, being commonly soon washed off by the rains, which are frequent on the Uralian mountains. He remarks also, that the turpentine resides in the bark, and the wood next to it, as is apparent when the trunk of the larch is sawed transversely; for then it may be seen that the inner wood for more than half the diameter is dry. It cannot, therefore, be of any use to drive the auger to almost the centre of the tree, as Dr. Anderson recommends.

Pallas mentions a gum that is yielded by the larch in particular circumstances. When the woods are on fire, which frequently happens in Russia, the larches are easily burnt on the side next the flame to the height of several feet, on account of the turpentine with which they abound. If the wood happens to be scorched to the pith, the inner part exudes a dry, reddish gum, rather less glutinous than gum arabic, having a slight taste of resin, but wholly soluble in water. It is used in medicine; and the native mountaineers chew it as an antiscorbutic, to fasten their teeth, and as a substance highly nutritive; they also use it as a glue to fasten their bows.

The Siberian hunters of ermines, when the ferment or yeast which they carry with them to make the acid liquor they call *quass*, is spoiled by the cold, scrape off the albumen or half formed wood between the bark and the wood of the larch, which is very juicy and sweet, digest it with water over the fire during an hour, mix it with their rye-meal, bury the dough in the snow, and after twelve hours find the ferment ready prepared in the subsiding fæces.

Old larches produce a fungus, which is described very much at large by Jacquin, in the first volume of his *Miscellanea*, under the name of *Boletus larcis*. It is also called *Agarcis (Agaricus) purgans*, and is used in the northern countries as an emetic in intermitting fevers. The Funguses dye the hair of the rein-deer with this fungus and the roots of gallium of a very deep red colour; whence perhaps it may be of some use in dying. The body of this fungus is saponacéous, and is used by the women in some parts of Siberia to wash themselves and their linen. It was celebrated formerly as a medicine, but is now deservedly fallen into a total disuse.

Bartholinus asserts that "the distilled water of the green cones takes away the wrinkles of the face, dipping cloths therein, and laying them on the skin becomes a cosmetic not to be despised.

It is an unfortunate draw back against so many recommendatory

facts, that the larch is sometimes liable to be attacked by a white insect, Coccus Larixea, which covers the tree like a hoar frost, and in some situations threatens the extinction of a plantation and the health of neighbouring trees.

Weak, unhealthy plants, growing in a wet sub-soil, or an excessively shallow barren soil, mere chalk or sand without a mixture of vegetable mould, are first visited and longest infected by it.

It is, however, almost impossible to say too much in favour of this tree. Its timber, whether in the water or in contact with the earth, being durable almost beyond conception.

We may safely conclude, with professor Martyn, that although we should be very cautious how we are carried away by novel ideas and upstart practices, however specious; yet, in the abundant evidence above quoted in favour of this tree, there seems sufficient ground for decision, and that no time ought to be lost in recommending it to the attention of government, and men of property in every district of the island, where barren sandy heaths are found."

In speaking on the red larch the following account of the culture of larch from seed may be selected, "the larch is raised from seeds which most years ripen very well in this country. The cones should be gathered about the end of November, and kept in a dry place till the spring, when they should be spread on a cloth and exposed to the sun, or laid before the fire, which will cause the scales of the cone to open and emit their seeds.

These should be sowed in a bed of light earth, covering them about half an inch deep with the same mould.* If this bed be netted over to keep off the birds, it will be a sure method of preventing them from destroying the young plants at their first coming out of the ground; at which time they should likewise be screened from the sun in the middle of the day, by covering the beds with mats, because too much sun frequently destroys the plants when they are young. In this bed the plants should remain until the following spring, when there should be a number of beds prepared in the nursery to receive the seedlings. In the beginning of April they should be transplanted into the beds, at the distance of six inches, row from row, and in the rows at three inches asunder, setting them in quincunx order. They should be immediately planted as they are drawn up, because their tender roots are soon dried and spoiled at this season of the year. This work should be done, if possible, in cloudy or rainy weather, and then the plants will soon draw out new

* This must certainly be a mis-print. The seed should never be covered deeper than a quarter of an inch.

fibres again; but, if the weather should prove clear and dry, the plants should be shaded every day from the sun with mats, and now and then gently refreshed with water. In drawing up the plants, there should be great care taken not to disturb the roots of those left in the seed beds; if the ground be hard, the beds should be well watered some time before the plants are thinned, to soften and loosen the earth; and if, after the plants are drawn out, the beds are again gently watered to settle the earth to the roots of the remaining plants, it will be of great service to them; but it must be done with great care, so as not to wash out their roots, or lay down the plants.

In these beds the plants may remain till the spring twelve-months after, by which time they will be fit to transplant, where they are to continue. When the young trees are planted out for good, they need not be more than eight or ten feet distant from each other, always planting them closer in exposed situations than where they are more defended; after planting, they will require no other care than to keep them clean from weeds for three or four years, till the trees have obtained strength, when they will over-top the weeds and prevent their growth; but the ground between these trees should not be dug, for that has been found greatly to stop their growth.

The Siberian larch is of slow growth in this country, for when the spring is mild, the trees will begin to shoot in February, or early in March, and if, as is often the case, a sharp frost succeed, these shoots are frequently killed, and the growth of the trees is stopped.

This species is a very proper tree for cold, moist, peat land, where it will thrive, and in such situations few other trees will grow.

The American larch thrives pretty well upon moist land, but on dry ground will make but little progress. A few of these trees, by way of variety, may be allowed to have place in every collection of trees designed for pleasure; but for profit, the common larch is to be preferred to any other species."

Thus much for extracting, at this time, we have only to add, that if the plates and references to them be made out clearer, and a little attention be paid as to the matter, nothing being found meagre, we have no doubt but this edition will answer.

MISCELLANEOUS INTELLIGENCE.

ARTICLE XXII.—QUERIES AND ANSWERS.

Answer to Correspondents and Queries, by the Author of the Domestic Gardeners' Manual.---Before I reply to J. B. I must require the readers to correct a few important errors of the press.—Vol. 3, page 100, the names Antipholi and Dromios' should commence with *Capital Letters*. The word *perstitesle* in the latin lines, at the conclusion page 101 should be *perstitisti*. Page 112, line 10, for "elements" read "element," omitting the terminal *s*; add an s to the word "concomitant" in line 29. Page 113, line 3, for "highly" read "slightly;" ditto, line 24, for "acid" read "arid."

I have not time, on the present occasion, to answer J. B. of Gosport, minutely. To his first query, Vol. 3, page 91, (for I conceive him to be identical with J. B. page 107.) I reply, that, unless parties meet on equal ground, there is little chance of arriving at a clear mutual understanding. My mind disclaims *in toto*, the existence of *latent caloric;* J. B.'s is evidently embued with that theory. I entreat him then, to wait for what I *must* notice upon the subjects of *light and heat;* also of *manures* in future articles. *Interim*,—I beg him to re-peruse the article upon Water, in the number for January. I therein find no passage which implies the theory that he ascribes to me: viz. "that I do not consider the union of the two gaseous compounds of water sufficiently accounted for by the evolution of *Caloric*." Caloric again! let him peruse Par. "Third," page, third, with attention. I base all my *theory*, (for in all other matters *I have adduced facts and experiments* of assured, admitted certainty) upon the universal distribution of *pure solar etherial electric light*. I advance it, fearless of denial, that LIGHT, perhaps modified, lies masked, in certain definite proportions and adaptations throughout all created matter: that it is the source of all attraction, decomposition, and chemical action. Has not Dr. Faraday very recently ascertained this to be the fact, by actual experiments? So at least he is (in sundry public Journals) said to have done, but as in my retired, and studious way of life, I am not at all times, able to ascertain what is going on in the scientific world. I have determined to apply to the fountain head, and to obtain from Dr. Faraday himself, direct information of what is discovered. For, if that which has been stated in the papers be correct, a triumph indeed is afforded to one who has for years advocated, without deviation, *the universality* of the *agency* of *etherial light.*

More hereafter.---I am gratified that my variety of Germek Melon pleased J. B.

W. D. (page 138) has my sincere thanks for the courtesy he has evinced. I wish I could address him more fully now, but circumstances prevent. Having grown the Housainee Melon only according to the method described in my papers, I cannot speak experimentally on the points upon which he requests to be informed. However, not to disappoint entirely, I can assure W. D. on the written authority of Mr. Knight, that this Persian variety will succeed perfectly in a common hotbed, provided the *fruit* be supported upon a little cradle, and do not rest upon the soil. My neighbour grew the plant well in a pigeon-holed pit, heated by dung linings; the bottom heat being derived from those linings acting through the medium of a hollow chamber. But what is most to the point, and gives assurance that the *vinery* of thirty feet, will, with judgment, bear fine fruit to perfection, may be ascertained by reference to the description of Mr. Knight's Melon-house, Vol. 1, page 263, and to F. H. S.'s paper, at page 302. W. D. on perusing these will, I conceive, go to work with confidence, and I heartily wish him success.

March 6th, 1834. G. I. T.

Sizes of Pots.—I should like a list of the sizes of flower pots, or a method of calculating the circumference and depth of them, according to the various numbers mentioned in the *Register*?

Poisonous Quality of the Laburnum.—A correspondent, in your last number, mentions concerning the partiality of Hares to the Laburnum. In my neighbourhood, a vast number of Hares have been found dead in and around the ornamental plantations. This loss is laid to the charge of the Laburnum, and recently they have all been grubbed up. I should be much obliged by further information concerning this tree, it being desirable to ascertain if our opinion of the poisonous quality of its bark be borne out by the observations made by others. The seed of the Laburnum is of a deleterious property, I having once been obliged to call in medical aid to a child which had eaten some of it. In the plantations, to which I refer, the Hares also fed on the Holly Crab and Scotch Fir, as well as on the Laburnum. Gallenarus.

P. S. The preservation of game in this place is of recent date, and the ornamental trees are of several years' growth. Are the Laburnums more poisonous when they attain a large growth, than when they are recently transplanted young from the nursery?

T. HARDCASTLE, PRINTER, CHURCH-STREET, SHEFFIELD.

THE

HORTICULTURAL REGISTER,

JUNE 1ST, 1834.

HORTICULTURE.

ARTICLE I.—CLASSIFICATION OF GARDEN PEAS.

(Continued from Page 213.)

No. 5. MARROWS.—DWARF—EARLY.

26. *Branching Marrow.*—Syn. New dwarf Pea.—Prolific Isle de France. Grows between eighteen inches and two feet high, very strong, branching a little, with short joints. Leaves large, dark green footstalks, rather long, the tendrils large and strong. Peduncles short, bearing two flowers, which are very large. Pods much larger than any of the dwarf peas, and fill well. An excellent bearer, of good quality, and is the earliest of the Marrow Peas. Seed white, rather large.

27. *Knight's Dwarf Marrow.*—Syn. Knight's new dwarf.

This variety grows between three and four feet high, strong and branching, with very short joints. Leaves middling size, darkish green. Petioles rather short, the tendrils large and numerous. Peduncles very short, bearing for the most part two flowers. Pods large, broad, and well filled. An abundant bearer, of excellent quality, and comes into use a few days after the preceding. Seed middling size, white, and much wrinkled.

6. MARROWS.—DWARF—LATE.

28. *Dwarf White Marrow.*—Syn. Early Rhenish Marrow, Dwarf Marrow.—Wabash Glory of England. Sansparchmin demi rames, Royal dwarf Marrow. Pois Sanspareil.

Grows between four and five feet high, strong, and the joints very distant. Leaves darkish green, and large. Petioles rather short, and the tendrils small. Peduncles short, bearing for the most part two flowers, which are very large. Pods large, broad, slightly curved, and well filled. A good bearer, and of excellent quality. Seed very large, and white.

29. *Dwarf Green Marrow.*—Syn. Green Marrow. Early green Marrow. New early green Marrow. New green Marrow. New extra green Marrow. Well's Marrowfat. Royal dwarf Marrow. Vert hatif a la moille. Wellington. New Wellington. Waterloo. Nonpareil. Holloway. Marrowfat. Large American green Marrowfat. Masters Imperial Marrowfat.

There is little or no difference in the growth of this from the preceding; but the leaves and pods are a much darker green. The principal difference, however, is in the colour of the seed, which in this variety is a blueish green in general, though some few occasionally nearly approach to white. It is equally as good a bearer as the preceding, and the seed is also very large.

No. 7. MARROWS.—TALL—EARLY.

30. *Smyrna.*—This somewhat resembles the dwarf white Marrows, but is of taller and much stronger growth, branching with short joints. Petioles long, and the tendrils large. Peduncles rather long, and the blossoms very large. Pods large, broad, and well filled. An excellent bearer, of good quality, and comes into use a few days after the Branching Marrow. Seed very large, white.

31. *Crown Pea.*—Syn. American Crown. Ture ou couronne. Turea fleur blanc.

This variety grows upwards of five feet high, very strong and much furrowed towards the extremity, where it is for the most part flattened; joints very distant. Leaves middling size, pale green. Peduncles short, and the flowers, which are large, form thick and irregular tufts at the end of each branch, from which it derives its name. Pods middling size, somewhat flattened, but well filled. An excellent bearer, of good quality, and ranks amongst the earliest of the Marrow Peas. Seed white, rather large.

8. MARROWS.—TALL—LATE.

32. *Knight's Tall Marrow.*—Syn. Knight's Pea. Knight's late. Knight's new. Pois ride.

This variety grows about six feet high, strong, and the joints rather distant. Leaves large, dark glaneous green. Petioles rather short, and the tendrils large. Peduncles short, and the flowers large. Pods large, broad, and well filled. Very prolific, and of excellent quality. Seed large, white, and, like the Knight's dwarf Marrow, is much wrinkled. It is one of the best late summer peas.

33. *Tall White Marrow.*—Syn. Tall Marrow. Large improved Marrowfat. Tall Carolina. Sanspareil. De Marly. New-tall Temple. Clive. Wootten. Princess. Large Carolina. Pois Suise.

This is the same, in every respect, as the dwarf white Marrow,

except that it is of much taller growth (it growing between six and seven feet high) and comes into use fully a fortnight later. It is also an abundant bearer, and of excellent quality. Seed white, large.

34. *Tall Green Marrow.*—Syn. New large green Marrow. Late green Marrow. Valley field pea. Imperial green Marrow. South sea Pea. There is no difference between this and the preceding, except that the leaves and pods are a darker green. An abundant bearer, and of excellent quality. Seed the same as those of the dwarf green Marrow.

35. *De Guiverigny.*—Syn. Carte blanc.—This variety is of large and strong growth, between six and seven feet high with rather short joints. Leaves large, pale green, Petioles long, the tendrils small, but numerous. Peduncles very short, bearing for the most part but one flower, which is very small. Pods much larger and broader than those of the White Marrows, which variety it somewhat resembles. It comes into use at the same time. Only a moderate bearer, but of excellent quality. Seed rather large, white.

36. *Large Green Marrow.*—This is a tall very late pea, between six and seven feet high, of strong growth, branching much, and the joints rather distant. Leaves darkish green, and very large. Petioles very long, with large tendrils. Peduncles very short. Pods very large, broad, and well filled. Very prolific, and of excellent quality. This is one of the largest peas in the collection. Seed very large, and darker colour than those of the Green Marrow.

9. SUGARS.—DWARF—EARLY.

37. *Dwarf Crooked Sugar.*—Early dwarf de Grace Sugar.—This is the smallest variety in the collection, not exceeding four inches in height, very strong, with short joints. Leaves dark green, very small. Petioles short, and the tendrils small. Peduncles not more than an inch in length, bearing two flowers, which are large, in proportion to the size of the plant. Pods very small, roundish, and well filled. Only a moderate bearer. Seed white, middling size.

38. *Early May Sugar.*—This variety grows about eighteen inches high, rather slender, with short joints. Leaves dark green, middling size. Petioles short, and the tendrils small. Peduncles short, bearing for the most part two flowers. Pods very long, broad, and well filled. A most abundant bearer, and of excellent quality. I have no doubt when this variety is better known, that it will be extensively cultivated, more particularly so on account of its being so very dwarf, and coming into use quite as soon as the early frame. Seed white, and large.

39. *Early Dutch Sugar.*---Syn. Pois a grosse cosse hatif.—Grows about two feet high, rather strong, with short joints: Leaves pale green, rather large. Petioles long, and the tendrils large. Peduncles short, and the flowers small. Pods small, roundish, and well filled. Only a moderate bearer, and of middling quality. Seed white, middling size.

40. *Dwarf Dutch Sugar.*---Syn. Nain suiree. Dwarf crooked Sugar. Grows about two feet high, very strong, branching and short joints. Leaves dark green, and small. Peduncles short, and the flowers mostly in pairs. Pods rather large and well filled. A good bearer, and comes in use about a fortnight after the Early May Sugar. Seed white, middling size.

10. SUGARS.—DWARF—LATE.

41. *Dwarf Sugar.*---Syn. Ledman's dwarf Sugar. This variety is of very strong growth, between three and four feet high, with short joints. Leaves dark green, and large. Petioles long, with large tendrils. Peduncles very short. Pods middling size, roundish, and well filled. A good bearer, and of good quality, but late. Seed white, middling size.

42. *New Tamarind.*---This variety grows between two and three feet high, strong and branching, with very short joints. Leaves middling size, dark green. Petioles long, and the tendrils small, and numerous. Peduncles short, and the flowers very small. Pods very large, remarkably long, roundish, and well filled. An abundant bearer, and of excellent quality. This is a fine pea, and ought to be cultivated in every garden. It is very late. Seed white, large.

43. *Gros nain sucre.*---This is a dwarf variety not exceeding eighteen inches high, very strong, with short joints. Leaves dark green, very small. Petioles very short, and the tendrils large and strong. Peduncles short, and the flowers rather small. Pods small, roundish, and well filled. An abundant bearer, and of good quality. Comes into use a few days after the Blue Imperial. Seed white, middling size.

11. SUGARS.—TALL—EARLY.

44. *Early Sugar.*---Syn. Early May Sugar. Early May. Early dutch. Nain a la Moelle d' Espagnes. This is of rather taller growth than the Early frame, remarkably slender, and the joints very distant. Leaves rather small, pale yellowish green, and thinly set on long petioles. Tendrils very small. Peduncles long, and the flowers small. An excellent bearer, and of good quality. Pods roundish, rather small, but well filled. Only a few days later than the Early frame. Seed white, very small.

12. SUGARS.—TALL—LATE.

45. *Tall Sugar.*---Syn. Sugar. Broad sword. Large crooked sugar. Sansparchmin blanc a grand cosse. Sansparchmin blanc tres long coss. Sansparchmin blanc a rames. Pois blanc a grande cosse. This variety grows between five and six feet high, strong, and the joints very distant. Leaves pale yellowish green, and large. Petioles very short, with small tendrils. Peduncles short, and the flowers very small. Pods very large and broad, frequently six inches in length. A good bearer, and of excellent quality. Comes into use about the same time as the Blue Imperial. Seed white, large.

46. *Late Tall Sugar.*---Syn. Tall Sugar.---Large green Sugar. Grows much the same height as the preceding, with short joints, very strong, and branching. Leaves very large, dark green. Petioles very long, with large tendrils. Peduncles long, bearing for the most part two flowers, which are rather small. Pods very similar to those of the Tall Sugar. A good bearer, and is about a fortnight later than that variety. Of good quality. Seed large, white.

47. *Late Wyker Sugar.*---Grows between six and seven feet high, rather strong, branching a little, with short joints. Leaves middling size, pale green. Petioles long, bearing small tendrils. Peduncles short. Pods rather small, roundish, and well filled. Very prolific, and of excellent quality. This is the latest of the Sugar Peas. Seed white, rather large.

13. GREY PEAS.—DWARF—EARLY.

48. *Purple Podded Grey.*---Syn. Creswell's new pea. This singular variety grows about five feet high, strong, the joints very distant, and deeply stained with purple. Leaves large, dark green. Petioles long, and the tendrils large. The peduncles, which are stained with purple, are short, and bear for the most part but one flower, which is of a light purple colour. Pods large, broad, and well filled: but what is most remarkable, they are a deep purple colour when young, and retain it till they are quite ripe. Seed large, irregularly round, and of a light or pale grey colour. It is a good bearer, but of course not fit for the table.

14. GREY PEAS.—DWARF—LATE.

49. *Dwarf Grey Pea.*---Syn. Large Grey. Grows between four and five feet high, strong, branching a little, with short joints. Leaves a dark glaneous green, middling size. Petioles short, and the tendrils small. Peduncles short, and the flowers rather darker colour than the other grey peas. Pods large, and well filled. A good bearer, and like the preceding and succeeding varieties only fit for field culture. Seed rather large, darkish grey.

15. GREY PEAS.—TALL—EARLY.

50. *Tall Capuainer.*---This variety grows about six feet high, strong and branching, with short joints. Petioles long, with small tendrils. Peduncles short, and the flowers of a pale purple colour. Pods very large, broad, and well filled. Only a moderate bearer. Seed large, irregularly round, of a pale grey colour, with a black eye.

16. GREY PEAS.—TALL—LATE.

51. *Dutch Grey.*---Grows between six and seven feet high, strong, and the joints very distant. Leaves large, dark green. Petioles long, with small tendrils. Peduncles long, and the flowers, which are very large, of a dark purple colour. Pods middling size, roundish, and well filled. A good bearer, and about a fortnight later than the preceding. Seed large, darkish grey, with a black eye.

52. *Maple Grey.*---Syn. Partridge Grey. Marlborough Grey. This somewhat resembles the Dutch Grey, but is of dwarfer growth, rather slender, with long joints. Leaves dark green, middling size. Petioles rather long, with small tendrils. Peduncles short, the flowers large, and of a dark purple colour. Pods small, roundish, and well filled. An excellent bearer, and a few days later than the Dutch Grey. Seed rather small, pale grey.

53. *Late Grey Rouncival.*---This variety grows between six and seven feet high, strong, and branching, with short joints. Leaves very large, of a lightish green colour. Petioles long, and the tendrils large. Peduncles short, the flowers white, and very small. Pods very large, broad, and well filled. A good bearer. Seed very large, brownish white, with a black eye.

54. *Grey Rouncival.*---Syn. Giant. Pois rouge, tres grande.—Grows upwards of seven feet high, strong and branching, with long joints. Leaves large, dark green. Petioles long, with small tendrils. Peduncles short, and the flowers light purple. Pods very large, broad, and well filled. Only a moderate bearer, and a few days later than the preceding. Seed large, dark grey, with a black eye.

55. *Scarlet Flowered Grey.*---Syn. Sansparchmin a fleur rouge. This variety grows between seven and eight feet high, strong, branching much with rather long joints. Leaves large, dark green. Petioles rather short, and the tendrils small. Peduncles short, and the flowers, which are small, are of a bright red or pink colour. Pods rather small, roundish, and well filled. A good bearer, but very late. Seed large, darkish grey. This variety, I have no doubt, would be a great acquisition to the ornamental departments.

A SELECTION OF TWELVE OF THE BEST VARIETIES TO CULTIVATE.

Bishop's Dwarf Prolific. Blue Prussian. Early Frame. Early Charlton. Dwarf Green Marrow. Knight's Tall Marrow. Knight's Dwarf Marrow. Crown. Large Green Marrow. Early May Sugar. Tamarind. Late Wyker Sugar.

ARTICLE II.

THE MANAGEMENT OF THE FIG-TREE,

As practised at Woburn Abbey, and detailed in the "Hortus Woburnensis."

THE Fig-tree, being a native of a warm climate, requires to be protected in this country from the winter frosts, for the preservation of the young fruit and branches.

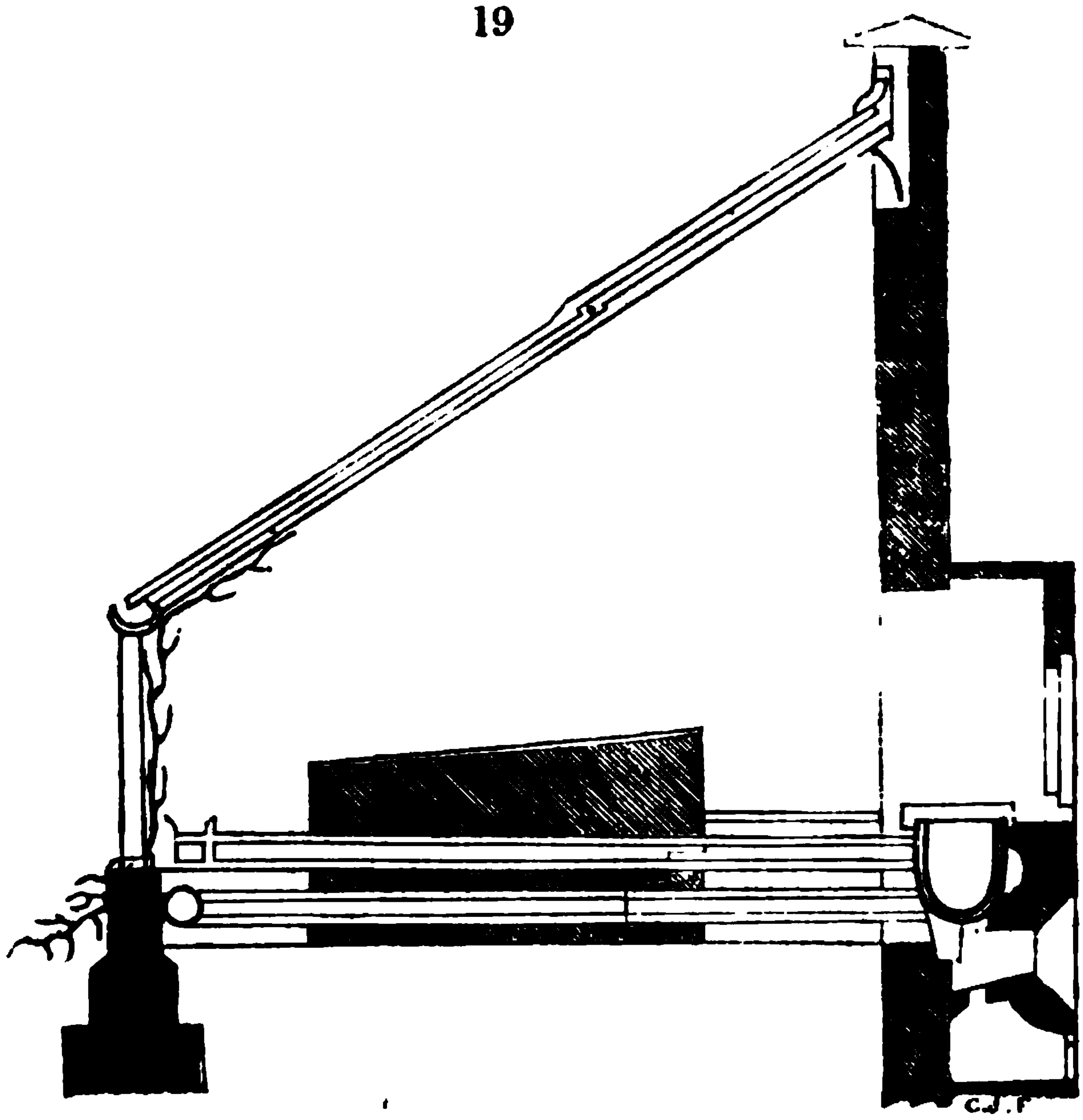
When planted out of doors, the shoots should be either enveloped in hay or straw bands, or thatched over with broom or fir branches; and thus many of the sorts will bring their fruit to a high state of perfection when planted against a south wall.

But when ripe Figs are wanted at table at an early period of the year, it is necessary to accelerate them by artificial heat, either in one of the forcing-houses, or in a separate compartment by themselves.

Plate 19 will illustrate the end, elevation, and section of the fig-house, at Woburn Abbey; which structure is also adapted for producing a crop of grapes, that may be either excited at the same time as the Fig-tree, or separately. As the front lights, and wall plates of this house, are so constructed as to admit the vines being taken out of doors, and exposed to external atmosphere, until it may be wished to accelerate them, the vines are planted on the outside of the front wall, and introduced close under the sill, which is formed into separate lengths, for the convenience of being removed, in order to give facility for the vines being taken out and into the house at pleasure, when one vine is confined to each rafter, where they produce an excellent crop of grapes, without injuring the Figs. Along the centre of the house is a pit four feet deep, by eight feet wide, for the formation of a bed of leaves, or any fermenting substances that will produce a mild bottom heat, wherein the plants are plunged, and from which their roots will make a rapid progress, and derive much nourishment. It will be necessary to have a large stock of plants of such kinds as are best adapted for early forcing, for many of the sorts are liable to cast their first crop when accelerated by artificial heat. It is, however, considered by some Horticulturists, that cutting off a portion of the roots round the ball of earth, will prevent the Fig-tree from losing its fruit. This mode of treatment I have frequently

resorted to, but could never observe any beneficial effects arising from it, in practice, as many of the sorts will drop their fruit when excited at an early period, treat them as you will. As soon as the violent heating of the bed has subsided, the pots should be plunged to the rims, and regularly supplied with water at the roots, as well as frequently syringed over-head. The temperature of the house may be commenced at fifty degrees, and gradually increased to seventy-five degrees, by the time the fruit is swelling off, which, if excited early in January, will be beginning to swell and ripen early in April, when a succession may be continued to the latter end of the season, from the same plants, by keeping them regularly supplied with heat and moisture.

19



Many of the sorts will succeed well, if potted in large pots, and kept at the temperature of the pine stove, and placed in pans of water, where they will have a regular supply of moisture at their roots. There is a Fig-tree in the Woburn Garden, that was planted out in a corner of the pine-house, about three years ago, which has annually produced, and brought to perfection, nine successive crops, and is at this time covered with an abundant shew of healthy Figs. The soil that they appear to grow and flourish in best, is a mixture of sandy loam and leaf-mould, intermixed with one-fourth of good rotten dung.

ARTICLE III.

THE HAND-BOOK OF GARDENING, IN PRINCIPLE AND PRACTICE, FOR THE USE OF SCHOOLS AND SELF-INSTRUCTION.

BY JAMES RENNIE, A. M.

Professor of Zoology, King's College London.—18 *mo*:—1*s.* 9*d.*

This little book was written at the request of J. S. Menteath, Esq. Closeburn-Hall, Dumfrieshire, chiefly for the use of the Scotch Peasantry. The author, after accounting for the appearance of the work, gives as a commencement the ground plans of a cottage, and garden. He then briefly treats on the science of gardening, and explains the reasons for performing various operations; the uses of the mouths of plants; the sorts of food taken up by them; changes undergone by the food; causes of the growth of plants; heat, cold, and shelter; seed-sowing; multiplying plants by cuttings, &c.

Then follows the art and practice of gardening, such as, rearing vegetables, fruits, and flowers. A calendar of work to be done every month in the year; succession of crops; and lastly, an index to the whole; which consists of 130 pages.

The volume throughout contains very pithy remarks and generally good directions, although in some cases they hardly agree with daily practical experience. Yet the work will be found to cottagers an excellent little guide; it will also be a nice hand-book for young gardeners, who may not have it in their power to buy a more expensive work, or, as is often the case, may have but little time to spare for reading. To all such we would recommend it, and that they may have some idea of its contents, we have made the following extracts.

Mouths of Garden Plants.—"All manure must not only be rendered liquid, but also be as thin as water, before it can be sucked up by the spongelets; and hence even the drainings of stables and dunghills, which are very rich in nourishment for plants, are too rich, that is, too thick to pass the small openings, till they are largely mixed with water, without which they will choke the crops instead of feeding them. When the leaves become yellow from this cause, they are usually said to be burnt by the heat of the manure. In the same way, the finest sort or the finest powdered lime, bones, or shells, cannot, till dissolved in water, get through the spongelets into any plant."

"It is on this account, that, in transplanting, the tips of the root fibres are pressed and obstructed by the earth of their new situation,

and are therefore unable to feed till they can place themselves in similar freedom in the earth as they *had* before transplanting. When they are bent or obstructed in this way, their growth is also prevented, and new fibres spring from other parts of the root, out of the materials which would otherwise have enlarged the old fibres.

Plants thus acquire a greater number of mouths, the oftener they are transplanted, a circumstance usually acted on by nurserymen, who shift their young trees and other plants for the purpose of multiplying their root fibres, and consequently of strengthening the plants, by giving them a greater facility of feeding from having more mouths to feed with. This is also important in cultivating cabbages and greens.

Every removal, however, must tend to obstruct or injure the root tips, and of course check the growth, by preventing them from feeding. But by lifting plants with balls of earth so as not disturb the root fibres, or by taking great care not to injure these, and at the same time spreading them carefully out by hand in their new situation, Sir Henry Stewart, of Allanton, has introduced the novel and successful practice, founded on science, of transplanting even the largest trees."

Food of Plants.—"The watering of a garden in dry weather, by throwing over it buckets of water from a pump, is of far less use than if the pump-water was thrown through the fine rose of a watering-pot, so that each drop might mix with and carry down a portion of air. Rain, again, which falls from a considerable height, must carry down a great deal of air, and hence it is found to fertilise more than any sort of watering by hand."

"Soils, where water does not circulate freely, are popularly termed cold and sour, though their chief defect is the want of a due supply of air. The water of such soils indeed tastes vapid, somewhat like water deprived of air by boiling. Too much water in a soil is certainly injurious; but even a rather wet soil will be greatly benefited if all its water be kept in free circulation by judicious draining, levelling, and sloping; or, in the case of stiff clays, by manuring with coal-ashes and the like, to open the texture of the soil."

"The mineral part of soil, exclusive of lime, contributes nothing to the food of plants. On these principles we can easily account for the barrenness of stiff clays, dry sands, and more particularly soils chiefly consisting of granite sand, as in Arran, and near Plymouth; while in the instance of sand or clay from basalt or whinstone, as well as from limestone and chalk, the carbonic acid gas tends to greater fertility, as in the Lothians, Ayrshire, and Kent. No mix-

ture then of clay and sand will be fertile without limestone, chalk, or basalt, that is, whinstone; and more particularly without decayed plants or manures, containing a large proportion of humic acid and other combinations of carbon and hydrogen."

CHANGES OF PLANT FOOD.—"When a soil is known to contain rotting weeds and other plants, or has had rotted manure spread over its surface, it cannot be too well dug and raked, in order to mix the richer parts of these with the less rich clay and sand; on the same principle that at dinner we mix in eating the richer beef or mutton, with the less rich potatoes, cabbage, and bread. Both we and the garden-plants must have a large portion of water to thin or dilute the food, otherwise health will suffer. The water which we drink in the form of tea, coffee, or beer, is similar in kind to the manured moisture sucked up by garden plants, which feed solely on liquid food."

THE SAP AND THE PULP.—"The change of sap into pulp cannot take place in the dark, sun-light being indispensable to open the pores; and hence plants growing under thick trees, or any thing that obstructs the sun's light, cannot well effect this important change, and the pulp being in consequence only prepared in small quantity, they become slender, yellowish, and sickly, for want of due nourishment. It is ignorantly said, that the trees draw them. Plants in pots, in an ill-lighted window, suffer the same inconvenience, and bend their heads as much as possible towards the light; not that they have any knowledge of the use of it, any more than a hungry infant has of the use of the milk which it greedily sucks, but because, in the part most exposed to the light a greater quantity of pulp is formed, which renders it firmer, heavier, and shorter, than the part less exposed, whose laxness causes it to give way and lengthen, on the same principle that a piece of somewhat moist paper will bend when exposed to the heat of a fire, from the side nearest the fire losing its moisture and contracting."

"When the change of sap into pulp is in any way prevented, as by shade or by moisture, the leaves naturally become yellow, as when plants in pots have more water given them in saucers or otherwise, than the sun-light can cause to pass off; or when they are root bound, and the root tips have not room to feed."

"By tying the leaves of lettuce near the top, the inmost leaves are kept from the light, and hence little or no pulp being formed there, they are rendered white, crisp, and tender; as cabbages and savoys grow of their own accord without tying, though tying hastens the process. This is called blanching, which means "whitening."

"In all cases, the more light plants are exposed to, the hardier they will be, provided they be not gorged with too watery food; and the less light they have, the more feeble, sickly, and yellow they will be. Light from above, also is greatly better than side light."

"The importance of wide planting, in most cases, will, therefore, be obvious; for if potatoes, cabbages, or other plants are crowded together, they become (at least at their sides) nearly as much shaded from the light by each other, as if growing under trees."

AIR.---"The importance of a free circulation of air to the healthy growth of plants must be obvious; and hence a garden cooped up between high walls or bushes, even though it have plenty of sunlight, which is still more indispensable than free air, will never produce good crops. It has been supposed by some also, that plants require to be somewhat moved and shaken by the winds, as a sort of exercise for circulating the sap and the pulp, insomuch as they cannot take walking exercise like animals. This, however, is only an ingenious fancy."

GROWTH OF PLANTS.---"When plants are stripped of their leaves by accident, such as by the ravages of caterpillars, or the browsing of cattle, they either die or become sickly, till new leaves, as will happen in vigorous plants, sprout again to prepare the necessary supplies of pulp."

"It is, therefore, an error to pick off leaves, as is sometimes done with the intention of exposing fruit, such as grapes, to the sun to hasten their ripening; for a supply of pulp is still more important to their ripening than such exposure, and without leaves no pulp can be formed."

REJECTION OF PLANTS, ROTATION OF CROPS.---"The fact has been long known to gardeners and farmers, that they could not get good crops of the same kinds from the same piece of ground, season after season, though the cause of this has only been investigated of late years, and has been proved, by experiments of Brugmans and Macaire, not to arise, as was formerly alleged, from the food in the soil being exhausted, since all plants feed nearly alike, but from the excrementitious slime which acts upon the same sort of plant that produce it, as a poison. Thus the slime from a crop of cabbages will greatly injure another crop of cabbages, though it will do little or no harm to potatoes or peas; while the slime from peas will injure peas, though it might not injure cabbages or turnips."

"When this is known, it will prevent two successive crops of the same kind from being tried, unless the ground be so trenched and dug as to bury the slime deeper than the roots can reach. In many

parts of Ireland, and probably of Scotland, the slime from potatoes is so mixed with the soil, that a good crop of potatoes cannot be had."

HEAT, COLD, AND SHELTER.—"Shelter will be most wanted in gardens during clear cloudless nights, in spring and autumn; for when there are clouds, they prevent a great deal of heat from streaming off into the upper air; and hence no dew (which is always caused by the moister or vapour in the air loosing its heat) is ever formed on a cloudy night; and the same holds for the same reason of hoar-frost. As dew will form on the underside of leaves, it is an error to say it falls. Snow acts similarly to clouds in preventing the heat of the ground from streaming off."

"Tender crops, such as lettuce, may be, on these principles, sheltered, during continued frost, by hoops bent over them, and covered with mats, straw, or fern leaves. They must, however, always be uncovered during the day in open weather to admit light and air."

"Rhubarb, and other plants and flowers whose stems die down, ought to have their roots covered over, during the cold season, with long dung, straw, or silver fir branches, removing these when the leaves shoot up in the spring.

Plants in pots ought, on the same principle, to be well exposed to light, not side light if possible, and air, in the day-time; at least when it does not freeze,—but closely housed every night; for the winter nights, even in open weather, are too cold for geraniums, hydrangeas, and other favourite window plants."

SEED SOWING.—"In sowing any sort of seed, these four circumstances must be carefully attended to. For want of heat, seeds will not come up during frost; for want of water, they will not come up in dry sand; for want of air, they will not come up if too deep in the ground; and if not duly covered, they will not come up from having too much light."

PLANTING POTATOES.---"When uncut potatoes are used, they must be planted at greater distances, to give room for the plants to get light and air, otherwise they may as well be planted under trees or hedges. The eyes or buds nearest the root fibre sprout a week or more later than those farthest from it, on the same principle that the top shoots of a tree come first into leaf, and therefore, in planting uncut sets, the produce will be unequal in size, and ripen at different times. In planting cut sets, the two sorts of eyes should be planted in separate rows, as is always done in Lancashire. Potatoes for planting are found to answer best when procured from a different soil, as they seem to like a change of food."

ARTICLE IV.

HORTICULTURAL CALENDAR FOR JUNE.

FRUIT DEPARTMENT.

Summer Pruning.---Peach and Nectarine trees, about the middle, will require all fore-right and ill-placed shoots rubbing off. Leave, however, a sufficient supply for bearing next year. About the end, thin the fruit where it grows in thick clusters.

Apricots.---Thin the fruit as recommended for peaches and nectarines, only apricots will require examining by the middle of the month.

Peach Trees in houses, now ripening their fruit, must have a deal of air, and be kept perfectly dry; hang nets underneath the trees to prevent the fruit falling to the ground.

Cherry Trees in houses should now be exposed to the air as much as convenient.

Vines in Pots, brought into the vinery in the beginning, will ripen their fruit the beginning of August. Those now introduced on the rafters will ripen their fruit by the end of October.

VEGETABLE DEPARTMENT.

Cucumbers.—Sow in the natural ground for pickling.

Cabbages.—Prick out those sown last month, and sow a little more seed for autumn coleworts.

Carrots and Parsnips require thinning, the former to six inches, and the latter to ten inches apart. Be very careful that the beds are kept free from weeds, to give the plants all possible light and air, or they will be short and spindley.

Celery.---About the end, make the trenches about five feet apart, one foot wide, and one foot deep; in these lay from four to six inches thickness of well rotted dung, and on the top of this, about two or three inches of good rich mould; in this place the young plants six inches apart. If the soil at the bottom of the trench be not very good, which is seldom the case, it is always preferable to cover the dung with some of the good soil taken out from near the surface. If the weather be dry, give a good supply of water every evening, with a rose watering-pot.

Broccoli.---Take advantage of dripping weather to plant out a moderate crop, two feet and a half apart; sow a little more seed, and prick out those sown last month. The soil suitable for them should be rather rich:

Beet Root.---Thin the red to twelve inches apart, and the green to six.

Endive.---Sow for the first principal crops, and plant out those sown last month, twelve inches apart.

Lettuce.---Thin out the plants on the seed-bed to a foot apart, and plant all the sorts the same distance; also sow more seeds of the Bath Coss, and other sorts.

Radishes.---Sow once a fortnight, both the short-top, and the red and white turnip-radish.

Onions.---Those intended to remain on the beds as full bulbers, must be thinned to four inches apart, and afterwards to six inches.

Peas and Beans.---Sow for successional crops as recommended last month. If the weather is dry, soak the seed in water for five or six hours previous to sowing.

Savoys.---Plant out the main crop for autumn and winter use, two feet apart; if the weather be dry, give them regularly a good supply of water until they become established.

Turnips.---Sow a good supply of the stone-top, twice during the month, and hoe and thin those sown before.

Kidney Beans.---Sow full crops both of dwarfs and runners.

ARTICLE V.---THE HORTICULTURAL JOURNAL,

AND FLORIST'S REGISTER OF USEFUL INFORMATION

CONNECTED WITH FLORICULTURE, ETC.

Dedicated to the Rt. Hon. the Earl of Errol, and the Vice-Presidents of the Metropolitan Society of Florists and Amateurs.—8vo. 1s. Monthly.

ELEVEN numbers of this work have appeared, the last of which is the only one we have seen. It contains two coloured plates, one of a tulip, and the other of a new Kennedya, both of which are, with regard to execution, done very well. We cannot say whether this number may be regarded as a fair criterion of the merit of the work. We fancy not, otherwise it would require no little hardihood to offer it to the public at one shilling per number. Who may be the conductor, we cannot tell; he has not chosen to make us acquainted with his name. He can hardly be a practical man, for the work is any thing but what by its title it professes to be. So far as we are able to judge, the number contains no really useful information.

If the work at all influences the public mind, (which we apprehend is not the case) it certainly will not add much honour to the Metro-

politan Society, or to its Noble and munificent Patrons. A Society, seated as it is, in the central emporium of science and art, ought at all events, if it do confer patronage, to patronize a work that would reflect credit both on its members, and on similar bodies of Amateurs and Florists throughout the country. Unless the previous numbers differ very materially from the one now before us; we need scarcely add, that the present work will never produce any such result. The numbers would not be dear at sixpence each, because of the coloured figures; though in every other respect we think the work unworthy of notice, especially as compared with periodicals on the same subjects now in the course of publication.

FLORICULTURE.

ARTICLE VI.—CULTURE OF THE GENUS DIANTHUS.

Almost all the species of this genus are held in great estimation, some for their peculiar beauty, and others for the delightful fragrance they emit. The annual species and varieties, as corymbosus, armeria, &c. require only to be sown as other annuals in the open border. The perennial herbaceous species differ very little as to their mode of treatment.

The Dianthus Barbatus, or Sweet William, is an old and well known inhabitant of our garden, and was much esteemed many years ago. The seed should be sown in May, with the other biennials. Prepare a bed of light earth, sufficiently large to hold the number of plants required; sow the seed, and cover it lightly, keeping it clear from weeds during the summer. Early in August, the plants may be removed, and planted in the places where they are intended to flower, or, if it is not convenient to remove them in August, they may remain in the seedling bed, until the arrangements are made in the spring.

This treatment will answer for all the species and varieties of similar habits to the Sweet William, as *aggregatus, latifolius, &c.* The Dianthus hybridus, or mule Pink, so well known, and much prized in our gardens, is probably a variety betwixt Poiret's Pink, and the common garden Pink, or betwixt the former and the Carnation. It requires the same treatment as the common Pink, which will be treated on hereafter; the culture of which, together with the Carnation and the Sweet William, may be taken as standards for the whole genus.

CULTURE OF THE CARNATION.—This is a plant of much value amongst florists. It appears to have been totally unknown to the ancients, in its cultivated state, although it has from time immemorial been a favorite flower in Europe. Gerard, in 1597, received it from Poland. It has been occasionally found in a wild state, in England, growing on rocks and walls. The generally received opinion, however, is, that it is a native of Germany and Italy, where it is much cultivated. In the beginning of the seventeenth century, there seems to have been about fifty good sorts known; and the most popular cultivator at that time, was a florist of the name of Tugge, who lived in Westminster. Early in the eighteenth century, as many as 350 or 360 valuable sorts were cultivated, which appear to almost equal our catalogues of the present day. Hogg, in his Treatise, published in 1820, enumerates the same quantity of sorts then in his possession. About the beginning of the last century, the first florists Society was formed, and shortly after several more, which awarded prizes to successful competitors, and which at once accounts for so large an assortment of Carnations at that time.

The florists of the present day divide the Carnation into the following classes:—

1. *Bizarres*, (from the French, signifying irregular, odd,) which consist of those whose flowers are striped with irregular spots and stripes, having two colours on a white ground.

2. *Flakes.*—Such as have only one colour on a white ground, being in large stripes going quite through the petals.

3. *Picotees.*—Such as have a fringed edge, usually a white ground, spotted or pounced with scarlet, red, purple, or other colours.

The following are considered by florists the requisite properties of a good Carnation:—

The flower-stem should be straight and strong, growing not less than thirty inches high, nor more than forty-five. The flower should not be less than three inches in diameter, and should be supported by the stem without drooping. The calyx should be strong, about an inch long, firm enough at the top to keep the base of the petals in a circular body, rising about half an inch above the calyx. The petals should be long, broad, and stiff, easy to expand, and make free flowers; the outer circle of petals, turning off gracefully, in a horizontal direction, and substantial enough ably to support the interior petals, which should decrease in size as they approach the centre, and with them the centre should be well filled up. They should lie over each in such a manner as that their beauties can meet the eye at once; their edges should be perfectly entire, without either notch, fringe, or indenture;

and of whatever colours the flowers may be composed, they should be perfectly distinct. The centre of the flower should not rise too high above the other parts; but the whole flower should be somewhat flat and even, and perfectly round at the outside. Each petal should have a due proportion of white, which should be perfectly pure and free from blemishes or spots;—of *Bizarres*, somewhat less than one half; *Flakes*, about one half; and *Picotees*, a little more than one half.

These flowers are usually propagated by layers, but they will also grow by pipings; and new varieties are raised from seeds. As very double flowers seldom produce seed, they are not to be depended upon for it; but in selecting plants for the purpose, always choose such plants as possess the very best properties in every other respect, except being double; that is, let the colours be clear and vivid, the petals strong, and well placed, and in every other respect answering to the above description. When these plants are selected, separate them from the rest, and place their pots upon a stage, in any open situation in the garden, sheltering the flowers from rains, by the covers hereafter described. Give them a regular supply of water, until the seed is perfectly ripe, which will take place in August, and which will be known by the seed-vessels becoming brown, and the seeds nearly black. This must be particularly attended to, for if gathered too soon, by far the greater part will be unproductive. It is always the best carefully to draw out the withered petals as soon as they become dry, because they are liable to cause mouldiness, by retaining a certain portion of moisture. When the seed is gathered, allow it to remain in the capsule until the middle of the following May, for it keeps much better in this way than when shaken out into paper.

Sowing Seed.—Fill some pots or pans with the compost in which the plants are recommended to be potted to within half an inch of the top at the edges, but somewhat higher in the middle. Sprinkle the soil with water, sow the seed, and cover it lightly with the same compost, finely sifted. When sown, place the pans in an airy part of the garden, keep the soil moderately moist, and shade them from the heat of the sun and dashing rains. When the seedling plants are three inches high, and have six leaves, plant them out on a bed of rich mould, composed of good loam and rotten dung, equal parts. Plant them in rows, about ten inches apart in the row, and twelve inches from row to row. When planted out, fix a quantity of hoops over the bed, and by means of mats, or other similar covering, shelter them from the effects of rains and frosts. By these means they will usually flower the following summer.

Soil.—Some distinction should be made in the soil for the strong and high-coloured carnations, which usually do not require a soil quite so strong and rich as the more delicate ones. Therefore, for the strong and high-coloured bizarres and picotees, take two barrowsful of rich maiden loam, and one barrowful of well rotted dung from a cucumber bed, and half a barrowful of river sand. For the rose and purple flakes and delicate picotees, take two barrowsful of good rich loam, and two barrowsful at least, of well rotted dung, and half a barrowful of river sand; mix and chop these well together in the autumn, and turn the compost two or three times during winter, but never pot in sifted soil. All the very choice kinds must, to have success, be grown in pots. The best sized pots for the purpose are twelve inches deep and ten inches wide at top, with a good sized hole at the bottom, and three or four small holes round the sides at the bottom, to facilitate the escape of the water, and prevent the danger of stagnation. The most proper time for potting is the middle of March: never defer it much longer or the plants will not flower freely. Potting is done in the common way, placing three in each pot. Be careful that the plants be placed no deeper in the pots than they were in those they previously occupied. After being potted, place them in an open airy part of the garden, and form an arch of hoops over them to preserve them from cold winds, dashing rains, and frosty nights. But when the weather is fine, they must be constantly exposed. Water them regularly, in this situation, with soft water, from a fine rose watering-pot. When the flower-stems are grown eight or ten inches high, tie them to neat sticks, for being very brittle, they are liable to be broken by the wind. When the stems are about sixteen or eighteen inches high, remove the pots to the situation where they are intended to flower. The stage on which they are placed for flowering should be composed of boards, raised about a foot from the ground, broad enough to hold either a single or double row of pots, according to the option of the cultivator; over this stage an awning must be raised, so that in case of rain the plants may be protected, or the colours will run and the beauty of the flowers be spoiled.

When the buds are all formed, thin out all the small ones, never leaving more than ten, nor less than four to flower; and let these be the finest and most promising buds. To prevent the buds bursting on one side, which is apt to be the case with many sorts, by which means the compact and graceful form of the flower is destroyed, tie a little bit of thread round the middle of the calyx, or a small narrow slip of bladder which may be long enough to lap over and be fastened with a little gum-water; also, with a sharp penknife, in some cases, cut the

calyx equally on every side, but this last system is apt to give a looseness to the flower, which partially destroys its beauty. When the flowers begin to open, they must be sheltered from the sun by means of strong paper covers; these must be about twelve inches diameter, painted white or green, and formed like an umbrella, to throw off the rain; each should have a square tin tube at the top that would allow the stick to which the stem is tied to pass through, as far as is necessary. This tube should be about two inches long, and have a small hole bored through one of its sides, that it may be fixed by a nail to any part of the stick required. When, however, a great many flowers advance into bloom, it is better to cover them with an awning.

In the beginning of August, they will be in full flower; when they begin to expand, a collar must be placed round the bottom of the flower to support it. "These collars are made of white card paper, in the form of a circle, of three or four inches in diameter, with a hole in the centre, just large enough to admit the calyx, or pod, without much compressing it, and with a cut extending from the centre to the outside or circumference, like the radius of a circle: on these the petals are finely disposed, and the beauty of the carnation displayed to great advantage." In the month of June, give the plants a top-dressing of leaf-mould and sheep-dung, which will give them a very healthy appearance, and enable them to grow much stronger, and give a greater richness and brilliancy of colour to the flowers.

Carnations are very apt to die off when they are just ready to flower; this is partly occasioned by growing them too strong during the winter season: for when the soil is very rich in which they are grown during winter, they make a very large quantity of roots, become strong, and throw up flowering stems. These luxuriant stems being pithy, the sap cannot properly circulate; this causes the plants to appear sickly, wearing a whitish hue, and when nearly coming into bloom they usually die, as though for want of water, which sometimes is injudiciously administered as a remedy. If the flowers are grown for competition, this sudden loss cannot altogether be avoided, for the rich soil gives a far greater brilliancy of colour: yet some usually run and become almost one colour, and others die. The best way is, therefore, to pot or plant some in rather poorer soil, which will flourish, and serve to perpetuate the sorts and the others will show the brilliancy of the flowers. The high-coloured varieties being most subject to run in the colours, none of them should ever be potted in too rich a soil. When it is thought well to plant them out in a bed instead of pots, make the soil moderately rich, and trample it rather

solid, after the manner of making an onion bed; this is found in a great measure to prevent their dying off just before flowering, because it partially checks their luxuriant growth.

Those who are curious usually take out carefully all petals that are not of a true colour, which if done well, and the remaining petals be carefully disposed, the loss will not be discovered. As soon as the flowers have turned the height of their perfection, the plants should be layered; if done sooner, the bloom will be impaired in consequence of the check given to the sap, by the operation of tongueing. Prepare a quantity of hooked pegs, and light soil composed of sandy loam and leaf mould. Prepare the layers by cutting off their lower leaves; next stir up the old earth in the pots, and fill up with the above soil not sifted; then make an incision with a sharp penknife by entering about a quarter of an inch below a joint, and passing the blade of the knife up through the centre of it, and continue to one half or three quarters of an inch above it. The portion of the stem left below the bottom of the joint must be cut off horizontally close to the joint, and this part of the operation is completed. The incision being thus made, the layer must be gently pressed into the mould, and secured by one of the pegs, not less than half an inch, nor more than an inch, below the surface, raise the extreme point of each layer as upright as possible, water and shade, as the weather may render it necessary, and they will have struck root in three weeks, and be ready to pot off in six weeks. The slit or tongue recommended to be made is requisite, to interrupt the downward flow of the pulp, so as to cause it to form root fibres, while the upward flow of sap in the more central parts being but little interrupted, the layered branch continues to grow nearly as if it had not been so treated.

When the layers have struck root, cut them off from the parent plants, with about an inch of the stalk below the incision attached, and plant them in forty-eight sized pots, filled with good loam and leaf mould, a single plant in each, if the plants are strong; if small, two or even three may be planted in each pot, placing them round the sides. When potted, place them under an arch of hoops in an open airy part of the garden; in this situation shelter them, by means of mats, from heavy dashing rains, and cold winds, till winter. About the middle of October, prepare a frame for the reception of the plants. In the first place, set it in a warm situation opposite the south, and fully exposed to the sun: raise it from the ground by laying a brick under each of the front corners, and two bricks under each of the back ones. This will give a good bevel towards the sun, then proceed to place all round the outsides of the frame not less than a foot

thick of soil, well trodden down, and raised nearly as high as the top of the frame. Next prepare the floor on which the plants are to be placed, first by laying a good quantity of lime scraps, and on the top of that, about six inches of coal-ashes, on which the plants are to stand. This floor will effectually prevent worms from penetrating, and also add much to the warmth and cleanliness of the plants. Elevating the frame, also, is far preferable to setting it on the ground, as it is not so liable to rot, and the more the plants are raised above the level of the surrounding earth, by a thick floor of ashes, &c. the more easily will they be kept from damp. The frame being thus prepared, remove the plants from the arched hoops, and place them on the floor of ashes, covering them with glasses in rainy or frosty weather. Carnations require very similar treatment in winter to Auriculas. They will bear a strong frost, if dry, without receiving material injury; but if the plants are wet, they usually suffer.

Great care must be taken not to shut them up too close if wet, or they are very apt to become infested with the mildew. When this is perceived, cut off the infected parts, or remove the diseased plants altogether from amongst the others, for the disease will rapidly spread. In consequence of wet and hazy weather, the soil in the pots will often become green with moss on the top; when this is the case, stir up the soil carefully about half an inch deep, and sprinkle a little coarse sand upon it. This operation should be performed as often as is requisite. Propagating carnations by pipings is not to be depended upon, although some sorts grow well, yet rarely more than one-half of the pipings that are put in ever strike root; but where the shoots are not long enough for laying, or are broken off by accident, piping is very necessary.

Prepare a slight hotbed in an eastern aspect, and as soon as the heat is moderate, lay on about six inches thickness of light mould, sifted finely. No piping should have less than two or three complete joints. Take off the cutting horizontally just below the second or third joint, and merely cut off the leaves from the joint that is to be inserted into the soil, but leave the upper ones entire, both in pipings and layers. After giving the earth of the bed a moderate watering, place on a hand or bell-glass to mark the boundaries in which the pipings are to be planted. Plant the pipings not more than an inch distant from each other, and half an inch deep, give them a gentle watering, to fix the soil closely about them, let them remain uncovered until the leaves are dry, then place on the glasses and press them gently down to prevent the admission of air. Give the

pipings a little morning sun, but always shade them when the heat becomes strong, which may be done by covering the glasses with mats. It is necessary after the first week, that the glasses be occasionally taken off to admit air; but this must never be done when the sun is powerful, but either in cloudy weather or early in the morning.

When the pipings are watered, never place the glasses over them again until the leaves are dry, and then not without first drying the glasses, or mildew will be the consequence; and this must be continued until the pipings are well rooted, which will be in about six weeks, when the glasses may be removed altogether. When rooted, plant them in forty-eight-sized pots, as recommended for layers, and place them in a frame for a while till they have made fresh roots, then expose them by degrees, and treat them like layers. Many insects are troublesome to this plant, as the aphis, or green fly, earwig, wire-worm, grub, snail, and slug; also a very small black insect which eats the colour off the petals. The earwig is the most dangerous, because it commonly secrets itself in the calyx, and bites off the petals at the lower ends, or claws, thereby causing them to fall out, and greatly disfigure the flower; so that if any of the petals hang loose, or fall out, you may be certain that an earwig has been, or is still there. The best remedy is to get a large saucer or feeder, and place on a brick in the centre, and fill up the saucer with water: if the pot is then placed on the brick, neither earwig, snail nor slug, will venture across. Also, set traps for them by placing tobacco-pipe heads on the tops of sticks; and by examining them every morning, the number of depredators will soon be lessened. The aphis, or green fly, may be destroyed by using weak tobacco water, or sprinkling a small portion of Scotch snuff upon the infested parts early in the morning, whilst the dew is upon their leaves.

The well known wire-worms we believe are the larvæ of two species of click beetles, the Hemirhipus lineatus and obscurus: we never had an opportunity of knowing, from practical observation, but they are stated to continue in the larvæ state for five years, during which time they feed on the roots of various plants. They are exceedingly destructive in newly made gardens, for several years taking off almost every crop both of flowers and vegetables. Many means have been adopted to eradicate them, some of which have proved successful. The best way appears to be that of allowing them by baits of different kinds. This was first suggested by Sir Joseph Banks, and has now become pretty generally adopted; the plan is this:—Where the insects abound, bury at about an inch under the surface of the soil

slices of either potatoes, turnips, parsnips, apples or carrots, sticking in each slice a small wooden skewer, to take it easily out of the soil with, also to mark the spot where the bait is buried. Examine these baits every day, or at farthest every other day, and kill the insects collected upon them. Some gardeners give preference to sliced beet root, or cabbage stumps, or young lettuce plants; whatever is used, there must be no neglect in examining and destroying the worms on them. After they have fed for five years, they go into the pupa state, and shortly appear as a chesnut-coloured beetle, when their existence appears to be very limited.

Culture of the Garden-Pink—Dianthus plumarius.—The pink has not been grown as a florist flower so long as the carnation. Till within the last fifty years, they were merely grown as border flowers; but so many new and beautiful varieties have since been raised, that it is now much prized and cultivated by amateurs. It is more hardy than the carnation, and much less expensive. Make the beds as follows:—Mix a quantity of fresh loamy soil with an equal portion of cow-dung, which has lain to rot for two years; and after having removed the old soil a foot and a half deep, make the deficiency up with the new compost, raising it somewhat higher than the surrounding surface, falling on each side from the centre, to cast off any excess of wet, and this should be repeated every successive year. Plant out in September those intended for blooming the following summer, for if delayed until spring, they never flower so well or show half the beauty as under other circumstances.

To have good flowers, the plants must be young, it is, therefore, indispensable where this is a desideratum, to raise new plants from pipings every year, because one year old plants bloom very superior to those of any other age. Put in the pipings about the middle or end of June, but never later than the first week in July; they will then be about two inches long. Prepare them after the manner recommended for Carnations. When the pipings are prepared, choose a shady part of the garden to plant them, and having dug the soil, which must be light and sandy, and smoothly raked the bed, water it with a rose watering pot, until the soil is completely saturated; then stick in the pipings about three inches apart, and place a hand glass over them. They will not require watering at that time if the soil be well wetted previous to inserting them in the bed.

When the pipings have begun to grow, and not till then, the glass may be removed for the first time; this will happen in about three weeks after they are planted. They may then be gradually exposed every fine day, until they are able to bear the open air. In hot wea-

ther, it is necessary to shade the flower buds, both previous to opening, and after they have opened, as recommended for carnations. This is generally done by placing small boards over them.

Seeds and Layers may be treated after the same manner as Carnations.

CRITERION OF A FINE PINK.—"The stem should be strong and erect, and not less than twelve inches high. The calyx smaller and shorter than that of the carnation, but nearly similar in proportion, as well as in the formation of the flower, which should not be less than two inches and a half in diameter. The petals should be large, broad, and substantial, and very fine fringed or serrated edges, free from deep notches or indentures; in short, they approach nearest to perfection when the fringe or edge is so fine as scarcely to be discernible; but if they could be obtained entire, it would be a desirable object. The broadest part of the lamina or broad end of the petals, should be perfectly white, and distinct from the eye, unless it be a laced pink, that is, one ornamented with a continuation of the colour of the eye round it, bold, clear, and distinct, having a considerable proportion of white in the centre, perfectly free from tinge or spot. The eye should consist of a bright or dark rich crimson or purple, resembling velvet, but the nearer it approaches to black, the more it is esteemed; its proportion should be about equal to that of the white, that it may neither appear too large nor too small."—*Maddock.*

ARTICLE VII.

FLORICULTURAL CALENDAR FOR JUNE.

Auriculas. —Pot the flowering plants, except such as are to produce seeds, which must not be potted until the seed is gathered. The proper sized pot for a good flowering plant is ten inches deep, and eight inches wide, at top, (inside measure.) Good drainage of broken pot is indispensable. In potting, never shake off all the soil from the roots, unless the roots be decayed; nor in taking off the decayed parts ever use a knife, but always break them off.

Biennials which have been raised on a slight hotbed, may be transplanted in the open borders or pots, in the beginning of the month.

Camellias having now completely set their flower-buds, may be gradually exposed to a lower temperature until the end of the month, when they may be set out of doors in a shady warm situation. It is

indispensable that every pot be kept free from worms. The safest way of preventing their entrance is to place the pots either on boards, or to put a piece of slate under each. If, however, any worms do effect an entrance as soon as it is observed, water the soil in the pot once or twice with a weak solution of lime and water, which will speedily cause them to come out.

Carnations in pots for flowering, should have a good top-dressing of leaf-mould and sheep-dung, early in the month.

Dahlias may be turned out into the situations where they are intended to flower, this should be done as early in the month as is convenient. Always select a cloudy or rainy day for the purpose.

Erica Cuttings should still be put in.

Greenhouse Plants should be set in a sheltered and somewhat shady situation out of doors in the beginning of the month.

Polyanthuses should now be potted except such are to produce seed; follow precisely the same rules as for auriculas in every thing but the soil, which must not be rich. Always break off the old carrot-like root, at every potting, leaving only the upper part where there are plenty of fibres.

Orange-Trees may now be propagated by cuttings, cut them off about twelve inches long, take off the leaves with a sharp knife from the lower part of each cutting, and plant a single one six inches deep in a pot eight inches deep and six wide, filled with two inches of drainage, and the remainder with pure river sand.

Ranunculuses now planted will flower in September. Let the bed on which they are planted be raised no higher than the surrounding surface, which will enable it to retain more moisture; plant the roots in the usual way, and give the bed a good watering with lime-water to destroy the worms. Afterwards keep the bed well watered with a thin solution of cow-dung and water, until the leaves appear. After they have come up, it is necessary to constantly shade, from ten o'clock in the morning to four or five o'clock in the afternoon, in sunny days; and this must be continued until they have done flowering. Water the other beds which are just coming into bloom, if the weather be dry, and continue to do so until they are in full flower; and shade where necessary.

ARTICLE VIII.—NEW AND RARE PLANTS,

FIGURED IN THE PERIODICALS FOR MAY.

CLASS I.—PLANTS WITH TWO COTYLEDONES.

LEGUMINOSÆ, or Pea Tribe.

LUPINUS LEPTOPHYLLUS.—This species is remarkable for its narrow leaves and hairy surface. It is about a foot high, the spike of flowers is elegantly coloured with blueish lilac, and there is a deep crimson stain in the middle of the standard. The spike is covered with flowers in an irregular manner, and crowned by the long linear tracts of the unexpanded blossoms. It is not so pretty a species as many others of this generally beautiful genus: it has hitherto produced but a very few seeds, which are usually small for a Lupin, and pale brown, mottled with a darker shade. It probably requires shade. The species is an annual.—*Botanical Register*.

PORTULACEÆ.

PORTULACA GILLIESII.—Dr. Gillies' Purslane. We are informed by Dr. Hooker, that it is a native of the plains of Mendoza. This circumstance will point out the cultivation it requires; for the dryness of that climate is so well known, that it may be easily understood, that it must be kept during winter in a well dried dry stove or greenhouse, allowing it water only when in a growing state. It is propagated readily by cuttings.—*Bot. Reg.* The flowers are a rich carmine colour.

LIMNANTHEÆ.

LIMNANTHES DOUGLASII.—Douglas's Limnanthes. A neat little annual with flowers of a delicate yellow colour, bordered with white, and slightly, but most agreeably fragrant. It is a native of California.—*Bot. Reg.*

RANUNCULACEÆ.

PÆONIA MOUTAN; var. variegata.—Party-coloured Tree Pæony. This handsome variety was raised at Arley, the seat of the Earl of Mountnorris. The Tree Pæonies are propagated by layers, which should be twisted a little, and the soil best adapted for them is a mixture of vegetable earth, and fresh meadow loam.—*Sw. Fl. Gard.*

CLASS II.—PLANTS WITH ONLY ONE COTYLEDON.

LILIACEÆ.

CALOCHORTUS VENUSTUS:—Spotted Calochortus. A very remarkable and bulbous plant, sent from California by Mr. Douglas to the Horticultural Society, in the last part of whose Transactions

it has been pnblished by Mr. Bentham. It appears to be cultivated without difficulty, it has hitherto been planted in the open border in the summer only; its bulbs have been taken up, when the leaves were withered, and have been kept dry till they began to shoot, which is about Christmas. And they have been planted in pots in the greenhouse, whence they will be again transferred to the open border, as soon as the chance of spring frosts is over. The petals of the flowers are pure white at all the widest parts, and yellowish at the base, where they have a deep crimson wedged shaped stain, terminated by a yellowish spot, and above the latter is another deep red stain.—*Bot. Reg.*

CALOCHORTUS SPLENDENS, Satiny Calochortus. Another fine species of Californian bulb, obtained by the Horticultural Society from Mr. Douglass. It requires the same treatment as C. venustus. Its flowers are smaller than the C. venustus, and the colour of them light purple.---*Botan. Register.*

ORCHIDEÆ.

CÆLOGYNE FLACCIDA, Drooping Cælogyne.—A very beautiful species was introduced by Dr. Wallich, and was communicated, with many other beautiful and rare Orchideous plants, to the gardens at Wentworth. It was discovered at Noakote, in Nepal, by Dr. Wallich.—*Bot. Mag.* The flowers are white and yellow.

LIPARIS GRUNEENSIS, S. Leone Liparis.---A native of Sierra Leone, whence plants were brought, in 1832, by Mr. Whitfield. It requires to be kept in a damp stove while growing, and in a cooler place when its leaves begin to decay.---*Bot. Reg.* It is scarcely worth growing, particularly where a selection is wanted.---COND.

The Botanical Register this month is very rich in subjects; out of the eight figures given, six are entirely new, and four very handsome. The Botanical Magazine, and Sweet's Flower Garden, are much as usual with regard to the subjects.

ARTICLE IX.—CULTURE OF BANKSIA.

BANKSIA is a very handsome and interesting genus, belonging to the Proteaceæ; the best mode of growing the species well is to make a mixture of one third peat, one third loam, and one third sand. The pots should be well drained in the following manner: place a piece of potsherd about half way over the hole at the bottom of the pot, then lay another piece against it so as to leave a hollow space; place some

smaller pieces round them, and others broken very small, on the top of these. All plants belonging to the Proteaceæ should be drained in the same manner, for the roots are very fond of running amongst the broken potsherds, and there is not so much danger of their being over watered. Care must be taken not to let them flag for want of water, as they seldom recover, if allowed to get very dry; they should also be placed in an airy part of the greenhouse when in doors, nothing being more beneficial to them than a free circulation of air. Cuttings are generally supposed to be difficult to root, but they will root readily, if properly managed. Let them be well ripened before they are taken off; then cut them at a joint, and plant them in pots of sand, without shortening any of the leaves, except on the part that is planted in the sand, where they should be taken off quite close; the less depth they are planted in the pots the better, if they only stand firm when the sand is well closed round them. Then place them under hand-glasses in the propagating house, but do not plunge them in heat. The glasses must be frequently taken off to give them air and dry them, or they are apt to damp off. When they are rooted, the sooner they are potted off in little pots the better, as the sand is liable to canker their roots, if left too long in it. When potted off, they should be placed in a close frame, but not on heat, as a bottom heat will destroy their roots; and they must be hardened to the air by degrees. Plants raised in this way have better roots, grow faster, and flower sooner, than plants raised from seeds. In raising them from seeds, they should be sown in the same kind of soil as the plants are grown in, and placed in the greenhouse; or if it is in summer, they will come up earlier if placed out in the open air. They will soon make their appearance, and they should be potted off in small pots, for if left in the seedpots too long, they are apt to die, and are more difficult to move with safety.—*Sweet's Cultivator.*

ARTICLE X.—CULTURE OF CISTUS.

Cistus is a beautiful genus, consisting of hardy shrubs, and others that require to be protected in winter, either in a greenhouse or in frames. The cultivation of them is not so general as it would otherwise be, on account of their being so little known; every cultivator varying their names, and confusing one with another. We hope to set this matter right, by the work we are now publishing on the tribe, where full and faithfully coloured figures will be given, as well as descriptions of all the species that can be procured; after

which we think they cannot fail to be understood. Most of the species will survive through the winter, in the open air, if the weather be not too severe; but is the safest to keep some of the kinds in pots, that they may be sheltered from severe frost; and they can be turned out in the borders in spring, when they will thrive and flower well. They will succeed in any common soil, or a mixture of loam and peat will suit them very well. They may be increased by layers; or young cuttings as soon as ripened, taken off at a joint, and planted under a hand-glass will root readily. They may be raised from seeds, which are produced in abundance.—*Sweet's Cultivator.*

ARTICLE XI.—CULTURE OF DIMACRIA.

Dimacria is one of the tuberous rooted genera belonging to Geraniaceae. Its species succeed best in an equal mixture of light turfy loam, peat, and sand; they require also to be kept quite dry, when not in a growing state, which commences as soon as they have done flowering, and have ripened their seeds. They then require to be kept in a cool situation, but out of the reach of frost; and as soon as they begin to push young leaves in the heart, they should have all the old mould shaken from their roots, and should be planted in fresh. In potting them, care must be taken not to bury the heart of the plant, or it will be apt to rot. When fresh planted they will require a little water, and as they grow they must be watered whenever they are dry, and if the pots get filled with roots, they must be shifted into larger ones, in the same sort of soil. The best method of increasing them is by the little tubers of the roots planted with their tops above the surface, that they may not rot.—*Sweet's Cultivator.*

ARTICLE XII.—CULTURE OF DRYANDRA.

Dryandra is a beautiful genus belonging to the Proteaceæ, and is nearly related to Banksia. Many new species have been introduced to our collections by Mr. Baxter, and are now for sale at the nursery of Mr. Mackay. The species thrive best in an equal mixture of light turfy loam, peat, and sand; the more sandy the soil is, the better they will thrive. The pots must be well drained with potsherds, which should be broken very small, as the roots are fond of running amongst them. Ripened cuttings, taken off at a joint, and planted in pots of sand, without shortening any of the leaves, will root freely

if placed under hand-glasses, but not plunged. As soon as rooted they should be potted off, as the sand will injure their roots, if they remain too long in it; then they should be placed in a close frame till they have taken fresh root, and must be hardened to the air by degrees. August and September is the best time for putting the cuttings; they will then be rooted by spring, or many of them.—*Sweet's Cultivator.*

ARTICLE XIII.—CULTURE OF AULAX.

AULAX is a pretty genus, belonging to the Proteaceæ, which thrives best in a very sandy loam, with a great many potsherds broken small at the bottom of the pot, to let the water drain off freely, as they frequently get too much water, which soddens the mould, and stagnates their growth. Ripened cuttings, taken off at a joint, and planted in a pot of sand, will strike root, if placed under a hand-glass, in the propagating-house, and the glass be occasionally left off, an hour or two at a time, to give them air, and keep them from damping, which should be done in a morning, before the sun has much power, or it will make them flag and injure them. Plants are readily raised from seeds, which should be sown in a mixture of two-thirds loam, and one-third sand. As soon as they come up, they should be planted off in small pots, in the same kind of soil, as they are very apt to die, if left too long in the seed-pot.—*Sweet's Cultivator.*

ARTICLE XIV.—CULTURE OF ARAUCARIA.

ARAUCARIA may be termed the handsomest genus of plants with which we are acquainted. A. imbricata, in particular, is certainly one of the grandest plants known. It will thrive well in the open air, with the protection of a mat or two in very severe weather, and when got pretty large will, no doubt, be perfectly hardy. A. excelsa, or Norfolk Island Pine, is also a beautiful tree, but will not do without the protection of a greenhouse. An equal mixture of sandy loam and peat will suit them very well; and cuttings may be rooted, though with difficulty, taken off at a joint in ripened wood, and planted in a pot of sand, which must be put under a hand-glass, in the propagating-house, but not plunged in heat.—*Sw. Cultivator.*

ARTICLE XV.—CULTURE OF ANTHOLYZA.

ANTHOLYZA is a genus belonging to the Irideæ, which thrives well in a mixture of loam and sand, with an equal quantity of decayed leaves or peat soil; and, like the rest of the family, they will succeed well by the side of a south wall, in a sandy soil. The bulbs being large, they may be planted full eight inches deep, so as to be out of the reach of frost; and a little dry litter should be thrown over them in very severe weather. But the best plan for growing all the plants of this family, such as Gladiolus, Ixia, Babiana, Watsonia, Sparaxis, Moraea, &c. is a pit built about two bricks thick, so as to keep out the frost, and to be covered with lights and mats in severe weather, but to be exposed to the air when the weather is fine and mild. The lights will also require to be put on when there is a superabundance of wet, or the bulbs will be likely to get rotten; they require no water when not in a growing state; and may be increased by offsets from the bulbs, or by seeds.—*Sweet's Bot. Cultivator.*

ARBORICULTURE AND RURAL AFFAIRS.

ARTICLE XVI.—AN ADDRESS

To the Owners and Occupiers of Land, in Great-Britain and Ireland,

ON THE

IMPORTANT DISCOVERY OF THE DECOMPOSITION OF COMMON SALT,

FOR THE PURPOSES OF MANURE;

Whereby an Acre of Land is prepared for the reception of any Crop, at a cost of 10s. only.

BY HENRY KEMP.

Pamphlet, 72 Pages.—Ridgway & Son, Piccadilly.

THE present depressed state of Agriculture, and the inadequacy of the dung produced on the farm to insure those returns in the crops which the farmer wishes, added to the great expense of purchasing a sufficient supply of dung for the purpose, have induced him to avail himself of almost any stimulant to supply the deficiency, such as bone-dust, rape-cake, woollen-rags, and a hundred other substances, and which cost him, on an average, as much as fifty shillings an acre, in order to answer the purpose in any material degree.

It may be remembered by some of our readers, that a while ago Mr. C. Johnson, of Great Totham, Essex, in writing on the subject of salt, strongly advocated its fertilizing properties in an unprepared state; and although in this state it has not, in general, answered the

expectations of those who tried it, yet the agricultural world are indebted to Mr. Johnson for his assiduity, and for the results which may follow his various experiments and observations. After numerous observations and experiments on sowing common salt, all of which were attended with but little success, Mr. Kemp adopted the conclusion, that if common salt contained any principle promotive of vegetation, in a considerable degree, it must undergo some process whereby that principle could be set at liberty, and rendered available as the food of plants.

Mr. Kemp has now discovered an easy and inexpensive mode of decomposition, which perfectly answers the end, and renders the salt, after this preparation, exceedingly valuable as an agriculture manure, being remarkably fertilizing to the land. His mode of decomposition is not detailed in the pamphlet; for he considers that so important a discovery certainly ought to bring some remuneration to the discoverer, beyond the mere approbation of his country. We have made the following extract from the pamphlet, to shew how sanguine are Mr. Kemp's expectations that it will fully answer the purpose for which he proposes it to be used.

"A very striking peculiarity in prepared salt is its great attraction for the moisture of the atmosphere. Although I have in a former part of this address disputed the accuracy of Mr. Johnson's remarks respecting the extent of the benefit conferred on soils by the absorbent property of manures, I am fully prepared to admit that very great advantage is derived from it. It will be recollected, that this gentleman asserts that the exclusive use of manures is to attract moisture from the air; whereas I am disposed to consider this property only so far valuable, as that it enables them to part with their nutritive matter, which matter is received into the plant and becomes a part of its organized structure.

"As the products of nature seem destined to perpetual change and alteration; and the fibrous roots of plants appear intended by providence to produce the first stage in the transmutation of inert matter into life, thus by decomposition and absorption earth becomes vegetable; vegetable matter is no sooner decomposed, in the stomach of animals, than it is capable of being converted into animal matter; and when farther purified by the delicate organs of the human body, reaches the utmost perfection of created intelligence."

Although I cannot give to water all the merit of sustaining vegetation, I allow there can be no vegetation without it, and that in proportion to the absorbent properties of manure, are the facilities afforded to plants to draw their nourishment from it. Admitting, then, the

rest importance of the moistening properties of these agents, I would observe, that whatever is done in this way by unprepared salt, is increased in a ten-fold degree by its decomposition. It is made so exceedingly deliquescent by its preparation, as to render the ground even sensibly moist after a long continuance of dry weather. This, I know, is an important remark, and I must beg not to be misunderstood. What I mean is this, whenever it is applied as a top dressing to land which is in a loose and friable state, (such, for instance, as a well-worked turnip fallow,) and slightly harrowed in, it is found to imbibe the moisture of the atmosphere so freely during a summer's night, as to be perfectly apparent on the surface early in the morning."

"The difference in this respect is very remarkable between the parts of a field, one portion of which shall have received the salt, and another, any other common manure; and though this distinction ceases to be visible in the state of the earth soon after the rays of the sun have fallen upon it, yet it would appear that the effect is felt throughout the day. I have often been struck with the surprising growth of the turnip in the great heats of summer, after this preparation. Instead of a stagnant and drooping condition, so common in droughty seasons, its growth is so promoted, that I have scarcely ever observed it to languish for want of rain, except in cases where the soil has been of the very worst description."

"Whatever may tend even to diminish the withering effects of drought, must be considered as of great consequence, indeed it can scarcely be too highly estimated. Every farmer well knows how great is the annoyance arising from the long absence of rain at this period of the year, and how fatal it often proves to the rising plant, by the increased activity which it gives to its great enemy the fly. There are, I think, but few practical men, who are disposed to put faith in any of the modes recommended as preventives to this evil: these are very properly looked on as mere nostrums; but they all agree as to the advantages afforded by an expeditious growth forcing it into that stage in which it ceases to be annoyed by these insects. For several years after the bone husbandry became common, it was imagined that this manure was proof against the worst weather, and that drilling dust and seed together, secured so speedy a germination, and such a rapid aftergrowth as to prove almost a complete antidote to the attack of fly."

Until within the last two years, we had a series of wet summers that the merits of a new manure in resisting the effects of drought could hardly be determined; but I apprehend those who placed a

confidence of this sort in bones have had their opinion considerably changed by the experience of the years 1832, and 1833. I have heard farmers say that in these two years, they could discern no greater exemption from the fly in fields that were boned, than in any other."

"Oil cake is another of those resources to supply the lack of yard manure, which in some districts is extensively applied. In Norfolk particularly, it has long been a favorite, and very deservedly so, for the best effects have resulted to that county from its general adoption. But excellent as this manure is in favourable seasons, I believe those who have had the greatest experience in it can testify that they have often been disappointed in bad ones, when they relied on it for a crop of turnips. As before stated, the turnip plant, from its great liability to be destroyed by the fly in its infancy, requires, more than any other, the immediate assistance of manure to push it forward to a state of security. The good effects of oil cake are found so contingent on the falling of rain soon after its application, that unless this happens, but little good is derivable from it in this point of view. The reason is obvious. It is necessary to render the cake so dry and hard, for the purpose of grinding it into powder for its proper distribution, that until it be thoroughly moistened by rain, no decomposition can take place, and as this process is necessary in all manures for their convertion into the food of plants, so the oil cake remains inoperative in the ground, till the weather supplies the requisite quantity of moisture. Valuable, therefore, as this manure undoubtedly is in many respects, the circumstance that it needs so large a supply of water at a season, the usual characteristic of which is great dryness, unfits it in a great measure for being relied on by the cultivator of turnips. When, however, all happens to be right as to season, there are but few matters used with more effect; and for all crops, the sowing of which occurs in the fall or early spring, its merits cannot be controverted."

"In estimating the value of artificial manures, it must not be forgotten, that their importance is commonly pretty much connected with their application to the culture of turnips, because it is for this crop the farmer generally finds himself at a loss to provide from his home supply. It being a general practice to employ the product of the farm-yard in manuring for wheat, this resource is equal to the demands of any other crop. I know that some of our leading agriculturists condemn the system of applying dung for wheat, but whether it be good or bad, it may be considered as almost the universal custom. Such being the case, it is for his turnips that the farmer

generally buys manures, if he buys at all. A very important quality, therefore, in these assistants is, that a great deal should be contained in a small compass, that they should be "multum in parvo," because at so busy a time it would be impossible to draw from a long distance, any material that required to be laid on in a large way, as dung for instance. At a time of the year when season is of so much consequence, the saving of a good one may entirely depend on the expedition with which the work is performed. The farmer, I am sure, has often lost his patience, while drawing from even the homesteads of his farm, the supplies necessary for his turnip crop; for though he may devote all his strength to the object, yet from the ponderous nature of the article, and the large quantity necessary, the despatch is very disproportioned to the work to be performed. It therefore follows, that artificial substitutes, for which he has to go to market, to be profitably employed, should be susceptible of great diffusion in proportion to their bulk. This is certainly the case with ground bones, and with rape cake, but still more so with prepared salt. With all of these, we are enabled by means of the drill machine, sowing seed and manure together, and the help of three men and three horses, to despatch from eight to ten acres a day, and where the broad casting machine is used, which for prepared salt is better than the drill, owing to the pungency of this manure requiring its more effectual intermixture with the soil, the quantity of work performed is quite as great, with less of horse and manual labour."

"Oil and blubber are possessed of very conspicuous properties as enrichers of the soil, almost the whole of their elements being convertible into the sustenance of vegetable life. Oil is a compound of carbon and hydrogen, and all kinds of vegetables feed on these greedily. Previously to the decomposition of salt, I made frequent trials with blubber, and the success which attended them led me to think that its usefulness would soon be generally known; but I believe its employment on land is, at present, very partial. Sir John Sinclair and others recommended it long ago. My experiments with it were first made on wheat, and the produce exceeded that from yard dung in the same field, but I thought it was not so lasting. For turnips it is very effective, and I never observed any injury from fly where it was used, the protection being afforded, as I conceived, by the offensive odour of the blubber.

"It would seem not improbable that those who have directed their attention to this substance as a manure, may have found some difficulty in preparing it for an equable distribution on the ground. This circumstance might have brought it into disrepute. Its thick and

clammy consistence gives it a very forbidding appearance to the eye of the farmer, and unless he be furnished with an effectual and simple method of laying it on, we need feel no surprise that he should hesitate about using it. As the plan I have pursued is so very much better than any other I have yet heard of, I will, for the information of those who have not hit upon it, describe it here. It may appear somewhat superfluous and out of place, perhaps, to those persons who have never associated the idea of a manure with oil or blubber, but to those who have, I have no doubt but it will prove acceptable. It should be recollected, that all the good effects that flow from rape-cake, may be attributed to the oil which it contains, and when we consider the very small portion which is left after the severe pressure to which the crushed rape-seed is submitted in the process of the manufacture, we need feel no surprise that we are able to employ so oily a matter as blubber advantageously. The common mode of preparing it is by incorporating it with light sandy earth, coal, or turf ashes, but these do not offer the requisite facilities for that minute division in the particles of the oil, so essential for giving it the fullest effect. The proper quantity of blubber for an acre of land, is the fourth part of a ton, or sixty gallons. It will, therefore, easily be conceived, that to cover evenly the whole surface of an acre with this quantity, the most must be made of it, but this cannot be done with either earth or ashes. Finding neither of these suitable for the purpose, I had recourse to saw-dust, and a more complete vehicle for diffusing an oily fluid over the surface of the earth cannot be imagined. The plan to be pursued is as follows:—take blubber in the proportion of a hogshead to an acre, and of saw-dust, twenty or twenty-five bushels, (that from soft wood, as deal, &c. is to be preferred,) spread the latter in some convenient covered place, about six or eight inches thick, then diffuse the blubber regularly over it. It is then immediately to be incorporated well together, by being several times turned, and left in a compact heap, till the next day; and it should every day be so effectually turned over, as that all the particles of saw-dust may be divided, as any neglect in this respect would cause the mixture to become knobby. It requires ten or twelve days to complete the operation, and the test of its fitness for use, is the altered colour and the absence of all adhesion in the dust. It should be borne in mind, that no larger quantity should be prepared at a time, than can then be conveniently used, because if it remains long unturned, it is liable to contract a mould and become adhesive. This preparation can either be drilled or sown broadcast from a seed-lip."

"To the artificial manures we have here enumerated, we could add some few others which are nearly equal in importance, and a great variety which are commonly applied as top-dressings to land, to make up for a deficiency in the staple manuring at the period of sowing. Some of these are very good for this purpose, though they are seldom relied on, but in conjunction with other matters previously laid on, and all that are efficacious are sold at a high price. The cost will, in most instances, be found to be in proportion to their usefulness. A sufficient quantity to put an acre of land in good heart cannot be obtained for less than from fifty to sixty shillings. Mark the difference in the expense of *decomposed salt.* For ten or twelve shillings we get enough of this material to do the work of any other that costs four or five times as much. A ton is sufficient for three acres. Think then of the facility of transporting such a means of fertility throughout the country. The great arteries for inland conveyance, rivers, canals, and rail-roads, offer the ready means of sending it to so many points, that a supply may, with ease, be obtained for every acre in the kingdom. Of all the manures, it may be said, that they are totally inadequate to the wants of the earth. In all probability, if the whole consumption of artificial manures in the country were concentrated on a single county, (say Yorkshire,) it would be sufficient so to satisfy its demands as to produce all the fertility of which it is capable. Now we have the satisfaction of knowing, that the sources of salt are absolutely boundless, not only for the supplying a kingdom, but for the wants of a world. The supply from mines and the ocean may well be considered infinite."

NATURAL HISTORY.

ARTICLE XVII.

THE PRESENT EXISTENCE OF MAMMOTHS, AND OF OTHER ANIMALS

Found contemperaneously with them, in a fossile state,

DISPUTED BY "A TRUTH LOVER."

In page, 141, I observed an extract, taken from the Field Naturalist's Magazine, in which it is stated as possible that the Icthyosaurus, Plesiosaurus, and the animals found contemporaneously with them in a fossil state, generally supposed to be extinct, may at present exist in *dense groves, mountains, valleys,* &c. two or three miles under the surface of the sea. The whole extract appears to me to abound with

absurdities. In the first place (unless the printing be incorrect)* this Naturalist does not name them properly. We have Icthyosarus and Plesiosarus, instead of Icthyosaurus and Plesiosaurus. These words being compounded from *icthus*, and *sauros*, fish and lizard, in Greek, and *Plesios* a neighbour, and *sauros*. Secondly, he mentions "dense groves," at a depth under the surface of the water, where it is evident trees could not grow; and thirdly, the Cornua Ammonis is called a "huge snail," when it was evidently a marine shellfish. The shell of the snail has no division whatever in it, but the shell of the Cornua Ammonis is full of divisions, which plainly shows that its inhabitant could not have been constructed like a snail. These divisions are supposed to have beeu fleshy valves, by means of which the animal rose and sunk, viz: when it desired to rise to the surface, it filled the spaces between the valves with air; when, on the contrary, it wished to sink, it compressed the air from the shell.

Fourthly, the Ornithocephali and Mammoths are placed among the marine animals, whereas the Ornithocephali were a species of bat, and the Mammoths were evidently no more inhabitants of the sea, than the elephant and Rhinóceros. They are divided into several species, the most remarkable of which are the Elephas Primigenius, Mastodon Giganteum, and Mega-therium. The Elephas Primigenius, was of about the same size as the present elephant, but it differed in one respect; viz. in having long woolly hair on every part of its body, and a mane of stiff bristles all along its back and neck. A specimen of it was found preserved entire in the ice, on the coast of Siberia. Nothing more than the skeleton of the Mastodon has been found, it was of stronger make than the E. Primigenius, its bones were more hard and compact, and its skull not quite so high. It is, however, evident from their teeth that they feed on vegetables. The Megatherium is far different from the two above-mentioned species, it was armed with huge claws, adapted for digging and scratching up the earth, and was covered with scales like the Armadillo. It belongs to the same description of animals as the Armadillo, manis, &c. which feed upon roots. None of these, therefore, could have inhabited the sea, indeed is there in nature an instance of any quadruped, the extremities of which are terminated by claws or hoofs inhabiting the sea?

Fifthly.—The Icthyosaurus, &c. and Mammoths are mentioned together; now all remains of the Icthyosaurus cease to be found long before those of the Mammoths occur, for whilst the former are met with in the secondary strata, the latter occur among strata of a confessedly modern date.

* It was an Error in Printing.

Having thus far pointed out the errors of this "Naturalist," I will proceed to the proposition itself, which is simply this: that it is possible the Icthyosaurus, and the *marine* animals found contemporaneously with it in a fossil state, may at present be existing two or three miles under the surface of the sea. I say *marine* animals, because it is evident, without further proof, that some of the animals found contemporaneously with it, could not exist in the sea at all. Now for a few simple facts; the skeleton of these animals which are found in the cliffs of lime in Dorsetshire, are pressed flat with the superincumbent weight; therefore, if their bones were not calculated to bear the pressure of a weight composed of at the most sixty feet of cliff superincumbent upon them, it necessarily follows that the pressure of 15,840 feet of water (which is the number of feet contained in three miles) would crush them to atoms. Nor can they ever rise from that depth, because if they did so they would be liable to the disturbance of storms, and might possibly be seen by navigators, or carried to the shore, of which circumstances happening there is no account. Besides, the position of the nostrils near the eyes shows that these animals were, like the whale, calculated to float on the surface, and spout the water through their nostrils.

ARTICLE XVIII.—ON THE PRODUCTION OF INFUSORIA.

BY E. G. BALLARD, ESQ.

Extracted from the Field Naturalist's Magazine, Vol. 2, page 146.

I SHALL first examine the putrefactive process in vegetable matter. Without entering minutely into the chemical analysis of vegetable matter, which, throughout the whole vegetable kingdom, according to Nicholson's Chemical Dictionary, amounts to no less than twenty-nine various ingredients, we may briefly observe that the following are universal constituents of all vegetable substances; namely, sugar; gum; starch; gluten; albumen; gelatine; wood; tibrin. Of these he gives the following definitions:—

Sugar.—Crystallises; soluble in water and alcohol; taste sweet; soluble in nitric acid, and yields oxalic acid.

Gum.—Does not crystallis; taste insipid; soluble in water, and forms mucilage; insoluble in alcohol; precipitated by silicated potash; soluble in nitric acid, and forms mucous and oxalic acids.

Starch.—A white powder, insoluble in cold water; taste insipid; soluble in hot water; opake and glutinous; precipitated by an infusion of nutgalls; precipitate redissolved by a heat of 120 deg.; insoluble in alcohol; soluble in dilute nitric acid, and precipitated by alcohol; with nitric acid yields oxalic acid and a waxy matter.

Gluten.—Forms a ductile, elastic mass, with water; partially soluble in water; precipitated by infusion of nutgalls, and oxegericycene muriatic acid; insoluble in alcohol; by fermentation becomes viscid and adhesive, and then assumes the properties of cheese; soluble in nitric acid, and yields oxalic acid.

Albumen.—Soluble in cold water; coagulated by heat, and becomes insoluble; insoluble in alcohol; precipitated by infusion of nutgalls; soluble in nitric acid; soon putrifies.

Gelatine.—Insipid; soluble in water; does not coagulate when heated; precipitated by infusion of galls.

Wood.—Composed of fibres; tasteless; insoluble in water and alcohol; soluble in weak alkaline lixivium; precipitated by acids; leaves much charcoal when distilled in a red heat; soluble in nitric acid, and yields oxalic acid.

Fibrin.—Tasteless; insoluble in water and alcohol; soluble in diluted alkalies, and in nitric acid; soon putrifies.

By this analytical survey, in which I have been minute on account of the future inductions, we may observe that, but the starch, fibrin and wood, are soluble in water, and the gluten partially so. We also find that the gluten, which remains undissolved, forms a ductile elastic mass with the water; and, besides, becomes viscid and adhesive by fermentation, and then assumes the properties of cheese. We discover that the albumen and the fibrin soon putrify. Thus we have, as the component parts of vegetable matter, *four* soluble substances, *three* insoluble, *one* partially soluble; and of these, two soon putrify. Besides these, we have, according to a more accurate chemical analysis, the elastic products or gases, carbon, hydrogen, and oxygen; nitrogen is a constituent principle of several, and the fixed and volatile alkalis are also found. Having now decided the component parts of the matter or subject in question, we come to the process by which it is decomposed, and the agent employed. The process is *maceration*, and the agent *water*.

Maceration is that process by which a body is steeped in a cold liquor. It does not differ from digesting, excepting that the term is never used when the temperature of the mass is raised beyond that of the surrounding air. On the nature and phenomenon of the putrefactive process in vegetable matter, we have the following excellent account in Rees' Encyclopædia:

"The conditions necessary for the putrefaction of vegetables are similar to those required in the putrefaction of animal substances. It is necessary that the organization be impregnated with water; the contact of air is necessary, as also a certain degree of heat; and for

the due effect of this kind of decomposition, the vegetables should be heaped together, and their juices be abundant. In these circumstances, the phenomena of decomposition are as follow: the colour of the vegetable is changed, the green leaves become yellow, the texture becomes lax, the parts less coherent, the colour of the vegetable itself changes to black or brown, the mass rises and perceptibly swells up, the heat becomes more intense, and is perceived on approaching the heap; and the fumes that arise have already a smell which sometimes is not disagreeable; at the same time bubbles arise and break at the surface of the liquid, when the vegetables are reduced to a *magma*, or mass of feculent matter. This gas is a mixture of nitrogen, hydrogen, and carbonic acid. At this epocha, likewise, an ammoniacal gas is emitted, which is formed in these circumstances; and in proportion as these appearances diminish, the strong and offensive odour is succeeded by another which is fainter and milder, and the mass becomes dry. The internal part still exhibits the vegetable structure when the stem is solid, and the fibrous matter has been the predominating principle; and it then constitutes manure or soil. Hence it arises that the herbaceous plants of a loose texture, and abounding in juices, are not capable of forming manure by their decomposition, but are reduced to a brown mass of little consistence, in which neither fibre nor texture is observed; and this is what for the most part forms vegetable mould."

This is decidedly one of the clearest descriptions that can possibly be given to the theory and phenomena of vegetable putrefaction. In the *usual circumstances* these are the following conditions:

Impregnation, not maceration, with water, the contact of air, and the accumulation of the vegetable matter in a heap. The results are: a change of colour, a change of consistence, a rising or swelling up of the mass, a great degree of heat, the disengagement of fœtid fumes, the envelopement of a combination of gases, the change of the vegetable substance into a magma or feculent mass, the drying of the remains into the form of manure, or vegetable mould.

The *required circumstances* are:—Maceration in *stagnant* and *unchanged* water; the imperfect access of air by the interposition of the surrounding water; the loose contact of the stalks or leaves of the vegetables, owing to their partial diffusion in a fluid medium. In all cases of philosophical, and more especially in chemical investigation, we are to consider *causes* and *effects*: the latter, by the immutable laws of nature, being the result of the former. If the *causes* (or *circumstances*) be precisely the same, the effects will exactly coincide; but, if the *effects* are different, we must seek for the *reason*

in some *alteration* or *modification* of the *cause.* Accordingly we find the following effects proceeding from their respective causes:

Cause.—Maceration in *stagnant* and *unchanged water.*

Effect.—The effect here is two-fold. The constant maceration of a vegetable when severed from its *root,* which is the natural medium by which moisture is received by the plant, cannot conduce to its nourishment, but will sensibly aid its decay, because no circulation can possibly take place; fresh water would, indeed, produce a temporary revival, but its death and decomposition would ultimately ensue. But, here is, a water *stagnant* and *unchanged;* and, consequently, not only maceration aids decay, but it is accelerated by the momentarily increasing quantity of decomposed vegetable matter, which arises from the process of putrefactive fermentation which is going on. Hence arise the *results* of gluten, gelatine, and magma; all of which are to be found in the water, and are the *solid* parts of the vegetable matter decomposed.

Cause.—The imperfect access of air, by the interposition of the surrounding water.

Effect.—This produces *results* different from the *usual circumstances.* The evaporation of moisture from the mass is prevented, and the water becomes changed in a considerable degree with those gases which would otherwise evolve. Hence the offensive smell of the mixture. The heat not being so powerful as when the vegetable matter is only *impregnated* with water, the gluten and gelatine still remain unchanged, and are dried in *suspension* in the water. The magma, which would be held and become vegetable mould, remains as a feculent matter; also held in *suspension* in the water. The ammonia, probably, which would have exhaled in the state of gas, is held in *solution* by the water, and gives it new properties.

Cause.—The loose context of the stalks or leaves of the vegetables, owing to their partial diffusion in a fluid medium.

Effect.—This will effectually prevent the extrication of the heat which is produced by the close context of the vegetable matter when in a heap; and, the decomposition will consequently be slower and more imperfect. Having gone through the principal elements of the subject, viz. the component parts of vegetables; the nature of putrefractive fermentation; the *usual circumstances,* and the *required circumstances* under which this process proceeds; the causes and effects of the required circumstances; we now come to demonstrate the actual state of the water, which we must now consider as an infusion, and how that state produces the animalcules.

We have then an *infusion* consisting of water, holding in *suspen-*

sion a compound of gluten, gelatine, albumen and magma, as also numerous insoluble ingredients. It holds in *solution* a portion of the nitrogen, hydrogen, and carbonic acid, and probably ammonia.

In this, when in a state of putrefactive fermentation, a number of minute animalcules (called *infusoria*) are detected by the aid of the microscope. To suppose that these animalcules are *produced* by the putrid infusion, without the agency of eggs from parent animalcules, would be to admit *equivocal generation*, a theory too absurd and monstrous for any philosopher, much less a Christian, to admit for a moment; but the puzzling question then presents itself whence did the eggs come?

To answer this question in a satisfactory manner to the minds of all enquirers, may be a matter of considerable difficulty; but I think our previous analytical investigation will lead to the following inductive reasoning:—

As these animalcules are found in liquids only, and the species referred to in putrefactive infusion generally, and as all stagnant waters which hold putrid vegetable matter in suspension afford some of them, I think we may conclude, that water is their native element, and putrid vegetable matter first their *nidus*, where they are hatched; and, perhaps, their first *pabulum* or food on their exclusion from the egg. I do not say their constant food, since the oxy-hydrogen microscope clearly shows that they are cannibals, and devour each other.

If, then, we consider the eggs to have been laid in the water, (though too small even for the most powerful glasses to detect) and only to require a proper nidus, pabulum, and temperature, to bring them to life, we have in the infusion in question all the conditions required, viz. gluten, gelatine, and magma, as nidus and pabulum, and the heat generated by the process of putrefactive fermentation; added to which we have the temperature of the atmosphere in the summer season, when they are most abundant.

ARTICLE XIX.—INSECTS DESTRUCTIVE TO PLANTS,

As enumerated by Mr. Main, in his excellent Practical Work,—"Physiology of Plants," *Lately Published.*

ALTHOUGH it be impossible to particularise every species of insect which breed and prey on plants, a few of the more common and noxious may be mentioned, in order to show how the health of plants is injured, and their members distorted or destroyed by their depredations.

Coccus.—This tribe of insects, of which the highly prized cochineal of commerce is the type, are found infesting plants in hot-houses, as well as several of our most useful fruit trees cultivated in the open air. The migratory white ones, frequently seen on pine-apple plants, are highly injurious by withdrawing the juices, and disfiguring the leaves, and still more when they fix themselves on the bottom of the stem among the roots. Both sexes are very minute when young; but the females after impregnation, grow to nearly a line in length, are then very sluggish, and probably die soon after they have produced their young.

The next species is the well known brown scale, so frequently seen on orange, myrtle, and other plants, whose leaves are of a firm texture. In early life they are wanderers and invisible to the naked eye; but like the preceding, the females, after impregnation become stationary and large, by forming a shield over their bodies, under which they bring forth, and rear their numerous progeny. It has been questioned, whether the scale, from under which the young ones come forth, be or be not a part of the body of the mother. If raised from the leaf by the point of a knife, there appear to be six legs, or tentacula spread out, three on each side, of a whitish colour, partly attached to the shell, and also to the leaf; but may not this covering be formed of a exudation from their bodies, by which their young are protected?

Another, but much larger scale coccus is occasionally found in hot-houses, on peach-trees, and vines. This is, perhaps, what is called the vine-fretter. Their economy is like the last, only with this difference, that as their young increase in size, the lower edge of the shield is raised up, and the progeny are suspended in a white silky web as large as a middling pea, from which they issue forth when able to provide for themselves.

Besides these cocci, common in gardens, two others are found in woods and hedges, one of which, coccus arborea, has lately found its way into gardens, seating itself on pear and apple trees, which it weakens considerably. In underwoods they attach themselves to the bark of red willow, and ash-poles, closely congregated together on the lower part of the stems. One of these has oval, the other kidney-shaped scales, or dorsal shields, about two-thirds of a line in length. Their injury to these forest trees, however, is imperceptible.

But the most destructive coccus in this country is what is called the American blight, or mealy aphis. This is the great pest of our apple-orchards, and to the same kind of trees in nurseries. The young are so exceedingly minute, that they can, apparently, enter the

pores of the epidermis, cause a swelling of the cuticle which soon after bursts. The insects then may be seen in the openings, covered with a white efflorescence ejected from their bodies, intended it would seem, either for the purpose of concealment, or as a protection, instead of the scales with which their less destructive congeners are provided.

As this species seems to prey on the juices which flow between the bark and wood, or on the tender substance of the envelope itself, the former years' wood becomes denuded, and the lacerated edges of the wound become corky and monstrous, increasing in size till it encircles the branch, when all communication with the roots is cut off; of course the branch, or if the insects have seized the stem, the whole head dies. Their manner of living and breeding is similar to that of the others mentioned above; the females attain the size of linseed nearly, and are constantly enveloped in the white covering peculiar to them, and by the buoyancy of which, it is said, they are wafted from tree to tree. They fix on the roots as well as on the branches of trees, and thus out of sight are often extensively injurious. The male is said to be a small black fly. The blood of these insects, if such it may be called, is always of a deep, lurid red, showing their affinity to the cochineal insect, indigenous to the Opuntia cochinilifera, in South America. It has been stated, that this coccus is the sole cause of the disease called canker; but this is a mistake, because cankered trees, both those of the orchard and forest, are every where seen unaccompanied by this or any similar insect. It is very true, however, that the dismemberment and distortions of the bark caused by either constitutional or accidental canker, are very likely to attract insects to nestle in, and this coccus as well as others; but the effects of constitutional canker may always be distinguished from those occasioned by the insect in question. It has also been said, that the American blight was introduced about 1788, from France, by the late Captain S. Swinton, R. N. who had a foreign nursery at that time, behind No. 6, Sloane-Street, Chelsea. But, however, true this may be, there is no doubt the same insect was in England long before that period; as old crab-trees standing in woods and hedges in the middle counties were then, as now, covered with it. An insect of the same family is frequently seen on the underground stems of lettuce, endive, and dandelions. Of all these insects, the mealy one infesting pines, and the last described so pernicious in orchards, are the most destructive; they both prey on the vitals of the plant, and their introduction among such as are clean should be carefully guarded against.

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A WORK, AS A COMPLETE GUIDE FOR A BAILIFF, WANTED.—I venture to ask you for one or two things which I think would be very useful both to me and many others. First, as I have just commenced Bailiff for a considerable estate, and wish to give satisfaction to my employer, I shall be obliged by your informing me which is the best published system of keeping a Bailiff's accompts, and if there is any work which treats of his duties, and what he ought to do, as respects his Master and his tenants planting, repairing, &c. &c. and the law and practice in the best regulated estates upon these subjects. The situation I have entered upon has been very much neglected, and I have much contention to meet;—a book of authority on these subjects would help me much. A comparison of the value of stone and bricks, tiles and slates, when drawn certain distances, how far a ton of one will go, as also the general price of such materials, and any other practical hints you can supply. You very probably have the means, from your very extensive practice, to supply much. I am satisfied if you would give it in a practical manner, not deviating into architecture and taste, or adorning expenses which will effect the purpose, but ruin the property and person who undertakes them on the one hand, or reducing too much what is really necessary and fit to be done by the landlord to the tenant, and the tenant to the landlord on the other, you will confer a great benefit on your readers.

X. Y.

WHY DOES THE ROSA SULPHUREA CAST ITS FLOWER-BUDS?—Never having seen in your *Register* any account of the Rosa Sulphurea. I should be very glad to be informed, by some of your numerous Correspondents, the cause of the buds falling off the tree just before the flowers open. I have sometimes thought the buds must be eaten by some insect, before they come to perfection: but there is none visible; the tree itself appears to be perfectly healthy, and is against a south wall. Y. X., A SUBSCRIBER.

AQUATICS.—Will you give me a few hints as to the management of Aquatics? How frequently ought the water to be changed? What soil should be used, and when should the plants be repotted?

ANAGALLIS WEBBIANA.—Is there any nicety in the culture of the Anagallis Webbiana? My plant seldom live beyond the year.

CHRYSANTHEMUMS.—I have difficulty in making some of the later sorts of Chrysanthemums flower; I have beautiful plants, and the buds form, but they die off without opening. How shall I treat them to have success?

T. HARDCASTLE, PRINTER, CHURCH-STREET, SHEFFIELD.

THE
HORTICULTURAL REGISTER,

JULY 1ST, 1834.

HORTICULTURE.

ARTICLE I.—ON CHEMISTRY,

AS CONNECTED WITH THE DEVELOPEMENT AND GROWTH OF PLANTS.

By the Author of the Domestic Gardeners' Manual.

FOURTH ARTICLE.

I CONCLUDED my last paper at page 154 of the present volume,* with a reference to the *phænomena of atmospheric pressure;* and I now resume the subject.

The air or atmosphere of our globe is an elastic fluid. That it *is* a *fluid,* no one can well doubt who considers its power of motion: it flows and moves in all directions. The *elasticity,* or property of expansion possessed by the air, is almost as apparent as its power of motion, and that this elastic force is greatly influenced by alterations in temperature, may be rendered manifest by the simple experiment of presenting a common bladder, which contains a small portion of air, to the action of fire in a grate. The air within will gradually expand; that is, it's particles will occupy more space, press against each other, and bear upon the loose and flaccid membrane of the bladder, in every direction, till they completely distend it. When it is in this state; if it be pressed by the hand, it will yield to the pressure, but will instantly recover its form on that being removed, with a spring, or elastic action; the touch, or propulsion exerted by the finger proving the fact, and determining at the same time, the

* The Reader is requested to correct the following errors of the press, which occurred in that paper, commencing page 145—viz. Page 146, line 17, for "quoted" read "quote." Page 147, line 13, for "*agricul.* SECTS." read "*Lectures.*" Page 147, line 15, insert (;) after the words "I add;" Page 150, line 24, for "*acid,* producing" alter to "acid—producing" by inserting a dash or hyphen between the two words; and omitting the italics. Page 151, line 20, for "azot nitrogen," read "or nitrogen." Page 153, line 1, for "nor attraction" read "or attraction." Page 153, line 20, for "*at* their instant re-union," read "of their &c." Page 153, line 30, for "Speculæ" read "Spiculæ."

nature of the elasticity of the confined air, by the *sensation* excited on the finger. It will be thereby evident, that, were it not for the resistance of the membrane, the air within it, would extend outwards, and occupy more space; and in fact, an increase of heat will, sometimes cause the expansive force to burst the bladder with a considerable explosion. By removing the bladder to a distance from the fire; the air will contract, the membrane will no longer be pressed outwards, and therefore, will soon resume its loose and flaccid appearance.

Persons who possess an air-pump, and the apparatus which instrument-makers term—"a *bladder and weights*"—can easily satisfy themselves that, a very minute portion of air in a sheep's bladder, (perhaps not so much as might be contained in the egg of a pullet,) is capable of not only distending the bladder to its utmost dimensions, but of raising a set of leads, weighing from twelve to fifteen pounds. The apparatus must be placed under the receiver of the pump, from which the air is to be withdrawn. The external *pressure* being thus removed, an effect equivalent to the action of *heat* is produced, and the air within the bladder expands, forcing up the mass of incumbent weights. This is a beautiful, convincing, and most important experiment; but like all the others, leaves the mind involved in wonder at the mysterious operation of the exciting *cause*.

Philosophers then, are correct, when they assert that "the atmosphere is an *elastic fluid* which invests the earth;—that it moves and presses equally *in all directions*, and therefore, rushes in, and fills every place not previously occupied by a more solid substance."

Air possesses *weight* as well as elasticity; and this can be proved by means of an accurate and delicate balance. It has been ascertained that, when the Barometer stands at 30 inches, and the Thermometer at 60 degrees, 100 cubical inches weigh about 31 grains. At this calculation, 1000 cubical inches will weigh 310 grains, and a cubic foot (or 1728 square inches) will, in round numbers, be estimated at 535 grains: these weights refer solely to air at the surface of the earth.

But as its particles press upon one another, so, as the distance above the surface increases, this pressure diminishes, and the density of the air becomes less. Hence, as we ascend in the aërial region, the bulk of air cannot be of the same weight, or exert the same elastic force. It becomes more attenuated,—that is, —the same quantity occupies an enlarged space; and in very elevated situations, retains scarcely enough of elastic power to expand the lungs; and respiration therefore, becomes laborious. We have no means to determine

with precision, to what altitude the atmosphere extends; but admitting that its limits may be forty-five or fifty miles above the surface-level of the sea, the pressure at that height, must be reduced below the power of common estimation: this may be somewhat elucidated by the following facts. At the surface of the ground,—water (as seen in the action of the common pump) may be raised by the pressure of the whole atmospheric column, nearly 34 feet. Mercury—a dense fluid metal,—may be made to ascend above 30 inches; but at the height of a few thousands of yards, a balloon of varnished, thin silk, filled with hydrogen gas (which is the lightest of all known fluids,—100 cubical inches weighing little more than two grains and a half,)—can no longer be supported. It cannot therefore be unphilosophical to conjecture that, the bounds of the atmosphere are limited,—that they extend not many miles above the surface of the globe.

I do not attempt to write a treatise on pneumatics; I merely wish to adduce a few plain facts, to prove, *first* that pressure and elasticity exist; and *second,* to introduce the reader to an enquiry into the cause or source of the several phænomena which they exhibit.

The Barometer, or weather-glass is an instrument by which the weight or pressure of the incumbent atmosphere is ascertained: its name is derived from two greek words pronounced *baros* and *metron;* the former implies *weight,* the latter *measure*: the instrument *measures* the *weight* of the air, in *inches* and $\frac{1}{100\text{th}}$ parts of inches. The general average height of the quicksilver in the weather-glass throughout Britain, may be somewhat under 30 inches; or in other words, the atmosphere,—which at a medium pressure at the earth's surface, exerts a force equal to the weight of *fifteen pounds upon every square inch* of surface,—is, under ordinary circumstances, able to sustain a column of mercury at the height of nearly 30 inches in the tube of the instrument. But variations in atmospheric pressure are continually taking place, and the rise or fall of the Barometer indicates these changes; it does not however point to their *causes;* these remain involved in mystery. It has been supposed that, "the increase of weight proceeds from the quantity of *water* dissolved in the air; this notion is however, refuted by the simple fact that, *when the barometer stands highest,* the air *is most dry*"—and vice versa. Again—"the order of the phænomena corresponds with the facts, that the barometer *is most steady* when the *weather is clear,* and fluctuates most with *clouds and rain.*"

These phænomena *have* occurred, and been noticed, and will be so again and again; but the very converse of them all have occur-

red: rain and clouds have frequently been concomitants of a very high state of the glass; and during easterly winds, a total state of suffusion, without a gleam of sunshine, has been maintained for days —nay weeks,—with great elevation of the mercury. Fine, clear, hot weather, with vast evaporation, has not uncommonly been witnessed at periods when the glass has been low, and the wind at south west.

I cannot pretend to elucidate causes so deeply involved in obscurity, and governed by inscrutable laws; but I may conjecture that all the phænomena, however opposed they may appear one to the other—tend to demonstrate that, vapors taken up from the land and waters into the atmosphere are, by the *electrising principle of light, converted into atmospheric air.* A vast atmosphere of steam, or watery vapor is, as we have seen, carried up into the atmosphere: millions of tons of water are daily, hourly, evaporated from the surfaces of sea and land! How are these employed—to *what* are they resolved? Let us take a case in point, and by bringing the enquiry before us in a tangible form, endeavour to arrive at an idea, at least, of the fact, and it's consequence.

The present dry season cannot prove a delusion. At the moment I write, the Barometer stands at the medium of the altitude which it has this year attained. Subsequently to the abatement of the vast continuous wind and rains of December and January, it gradually rose to 30 inches, thence to 30 $\frac{46}{100\text{ths}}$ (the greatest elevation which I have observed in Berkshire,) and *that* on March 16th. From that period, it fell to 29 $\frac{80}{100\text{ths}}$, but recovered its altitude in a great degree. During the present month it has fluctuated between 30. 16 and 30 $\frac{30}{100\text{ths}}$—its medium being rather above 30. 20. This atmospheric weight,—almost unexampled in steadiness and duration—has been attended with brilliant sunshine and perfect drought. The wind has varied a few points from the east, has been piercing at times, but generally unattended with that usual unpleasant concomitants of spring, east, winds.

The volume of water carried up into the aërial ocean must have been enormous, and yet the aridity, the perfect dryness of the air has been almost undeviating. What has become of the watery vapor, where is it accumulated, or to what region has it departed? Drought prevails here and elsewhere, barometer elevation is maintained, no rain of moment has fallen since the last week of January, the precipitation even of the *dew* has been extremely minute! Occasional hoar-frosts have occurred; but the only marked feature of the last six or seven weeks has been premature, confirmed aridity.

Now, as steam and vapor are lighter than air, as clouds formed in the atmosphere *float* in that medium, what can have prevented the air from becoming *lighter* by its admixture with the never ceasing accumulation of watery vapor, during a period of six weeks? We see by facts of frequent occurrence that, drought, or evaporation do not depend altogether upon *heat*. A parching east wind will at times dry the ground much more effectually than the rays of a hot sun: hay will "make" much quicker on some occasions under a cloudy sky, than in bright sunshine. In showery weather the evaporation (with a temperature of perhaps 50 to 60) will be vastly more rapid than during a clear sun and great thermometric heat. In October, I have seen the instrument at 70—73 degs.—the barometer at 30 inches, the heavens cloudless; and with all these requisites of perfectly fine weather, the evaporation has been trifling, the dews have been intense and durable, and every stone of a pavement has been covered with water! I shall not now insist upon other facts; sufficient have been alluded to—I trust—to induce thought and reflection. Without asserting any thing, I venture again, and urgently, to suggest that, the watery vapors *must* either render the atmosphere specifically *lighter*, in proportion to the quantity in which they are present; or that they enter into *union, and become one with it*, by a peculiar electric action. If my view be correct, then, in proportion as vapor is converted into air, the weight of that air must be increased, because its bulk is enlarged. I believe that this bulk is perpetually subject to changes; and that these alterations are at all times produced by the decomposition and reformation of the vapors of the atmosphere. The agency, its mode of operation, and the proximate cause, are hidden secrets: we see not the machinery, and can only draw inferences from the observation of effects.

UPON HEAT, AND ITS CONNECTION WITH THE PHÆNOMENA OF THE DEW.—Of Heat, its nature, substantiality, or immateriality, it must be acknowledged that, we really *know* little or nothing. We may define terms, and conjecture with Lavoisier (as he stated in his memoir in 1777) that it is a *material substance*—for after attentively considering the phænomena of attraction and repulsion, he conceived it "difficult to comprehend these phænomena without admitting them as the effects of a real material substance, or very *subtile fluid*, which, insinuating itself between the particles of bodies, separates them from each other." To this substance, the renowned father of modern chemistry applied the name of *igneous fluid*, (from *ignis*—latin for *fire;*) and the *matter* of heat: Subsequently, in conjunction with other chemists, his great coadjutors, with a view of

rejecting "all periphrastic expressions," he distinguished "the *cause* of heat, or that exquisitely elastic fluid which produces it, by the term *Caloric*."—(*Calor*—latin—HEAT.)

We may admit these conjectures—or with Dr. Young, the philosopher, we may doubt the theory of the modern school. He believed that the production of heat by friction, appeared to afford an unanswerable confutation of the whole doctrine. "If the heat is neither received from the surrounding bodies, which it cannot be without *a depression of their temperature*, nor derived from the quantity already accumulated in the bodies themselves, which it could not be, even if their capacities were diminished in any imaginable degree, there is no alternative but to allow that heat *must be generated* by friction: and if it is *generated out of nothing*, it cannot *be matter*, nor even an immaterial, or semi-material substance."

Difficulties surround the subject on every hand; and to remove them, I conceive we can only apply—philosophically—to the *source of heat;* for source it has but *one*. The *sun* is the object to which we must turn our minds; and therein we shall, at least, obtain some solid cause for satisfaction. We may not be able to conjecture what this glorious luminary really is,—and we may find ourselves at a loss to conceive the nature of his substance, or what is the agency by which he radiates light and heat to the planetary system: but still, we feel assured that we have *reality* before us—that we see an effulgent orb, which our senses assure us is ever pouring forth streams of light and life. Now, from the beginning of time, the sun has sent his beams to the earth, and though, we have fair reason to conclude that they produce no *positive heat* till they strike upon a decomposable reflecting substance, yet the beams are the operative, efficient, cause of heat. From the period of the first ray to the passing moment of time present, not a particle of light has been wasted, or extinguished: the traceable analogy of all nature confirms, I think, this assertion. The light not reflected, is absorbed by all substances upon which it impinges, and effects electro-chemical decompositions, becoming itself perhaps decomposed. The HEAT which is manifested by fermenting substances, by chemical mixtures, by acts of friction, and which is *felt*, but *not seen*, is an effect produced by the play of affinities operated by the agency of absorbed solar light: the whole theory of *latent heat* is based upon this fact.

THAT *which at any time*, or by *any means*, *becomes revealed*, must have *existed*, must have had *an origin*. I ask the candid reader then, whether the emanations from the sun, the effulgence which has beamed upon the earth for thousands of years, do not offer

a more rational solution of all the phænomena of heat, than that which is attempted to be given by the theory that, "the earth and each planet belonging to this system, is furnished with the necessary portion of *caloric*, and the rays of the sun elicit the native caloric which is inherent in them, and occasion what is called heat." (See Parkes's Rudiments, No. 50—60, &c.) I shall not enlarge in an enquiry which must be referred to the action of *Light*—and will be pursued in a future paper. I do not deny that heat may lie hidden and masked throughout nature; but I conceive that in whatever state it exists, whether latent or revealed, *it is an effect* produced by the agency of the sun-beams, that have been, and continue to be, absorbed; and not a material essence, *Sui-generis*, which is integral with the substance of matter and independent of solar agency.

Heat is said to *radiate* from the surface of the earth, and this radiation connected with the aqueous vapor which exists in the air, is the direct cause of the deposition of the DEW.

Upon this subject, in order to present some clear idea of the received theory, I must quote a few lines from the work of the late Doctor Wells.

"Heat—it is observed—is *radiated by the sun* to the earth, and if suffered to accumulate would quickly destroy the present constitution of the globe. This evil is prevented by the radiation of heat from the earth to the heavens, during the night, when it receives from them little or no heat in return. The surface of the earth having thus become colder than the neighbouring air condenses a part of the watery vapor of the atmosphere *into dew*. This fluid appears chiefly where it is most wanted, on herbage and low plants, avoiding in a great measure, rocks, bare earth, and considerable masses of earth."

I must stop here to make a remark or two; for the foregoing observations contain much of truth, and *more* that has merely a plausible appearance of truth. The surface of the earth *does* become, at times colder than the air about it—this is a fact; but herein there is an evident departure from the ordinary law that governs the distribution of heat; for bodies of different degrees of temperature when brought into contact, tend mutually to *equalise* the temperature of each: heat will be attracted from the one, and then it may be said to radiate heat to the other; but the heated body will not thereby be so deprived of its heat as to become *colder* than the one which acted upon it: the attraction and radiation will proceed, till both bodies become of *equal temperature*. If then, the air become cooled by the absence of solar light, and the surface of the ground be there-

by excited to radiate the heat it had received, it ought to do so, till it be cooled down to the temperature of the air, and no lower: But if—as indeed is the fact—the surface—especially that covered by herbages—become *cooler* than the air, then there must be some agency in operation which is not manifested by the received theory: in other words, the reasoning made use of will not fully explain or elucidate the phænomena to which it is applied. The act of radiation implies a power that is concealed, and therefore very difficult to be appreciated: still however, it is known that, living vegetable bodies rank among the best conductors of *electricity*: they become sooner dewed; but they do not, by any means, appear to be active *radiators* of *heat* naturally. This conduction therefore, of heat, seems to depend upon *that* agency which stimulated the flow of the vegetable currents,—the electric vital fluid which induces the ascent of the sap;—and if so, then, *that radiation* which brings down the temperature of the vegetable body below that of the surrounding air, is an *electrical phænomenon.*

A covering of clouds is inimical to the deposition of dew. Dr. Wells argues that dews appear only on calm, clear, nights, and that very little is ever deposited in opposite circumstances, and *that little,* only when clouds are very high. Dew is never seen in nights both cloudy and windy; and if, in the course of the night, the weather from being serene, should become dark and stormy, *dew which had been deposited, will disappear.* When *warmth* of atmosphere is compatible with clearness, as is the case in southern latitudes, though seldom in our country, the dew becomes much more copious, because the air then contains much more moisture.

The first part of this paragraph contains much truth, because it simply describes *an effect;* as to the cause, we must look for it in *that* which *induces* radiation. In a clear state of the atmosphere, cold generally increases, and dew is deposited. By some secret agency, the electrical surfaces are, I think, changed. The ground is in one case the *attractor,* and as the source of heat is etherial fire, *that fire* is first attracted by the points of the vegetable bodies;—those prime and most active conductors; and in this act, the particles of vapor are deprived of that fluid which had kept them in a state of repulsion—they coalesce by the abstraction of their electricity, and are deposited upon the conducting herbage; particularly,—and most copiously,—upon its pointed terminations. This conducting power, possessed in so intense a degree by grass, and living vegetables, will explain *why* the *surface* of the ground becomes *coldest* in their immediate vicinity—for they abstract all the etherial fire from the air

immediately in contact with them. But as they are only the instruments, and not the *causes* of the phænomenon, some mighty agent induces, as before stated, a change in the aërial region, and renders that region the *attracting surface by producing a stratum or body of clouds*: the vapors then, are drawn upwards: the etherial matter in the opposite surface of the ground, under the clouds, is poured forth—*still through* the herbage as its conducting medium,—renders that surface warmer, attenuates the watery deposit upon the points of plants, and bears it upward in the form of vapors, which join, and congregate with the attracting stratum of clouds.

The second part of the paragraph asserts that when *warmth* is compatible with *clearness*, the dew becomes very copious. This seems to be an assumption of a fact that occasionally may be, and is, in conformity with the order of nature, but which is by no means generally so. In very dry summers, the dew rapidly diminished: in 1818, when the temperature at night ranged between 60 and 70 degs. for weeks together, scarcely any dew was deposited. Confirmed drought, perfect clearness, and *high temperature*, by *day and night*, were unproductive of dews, though the evaporation must have been at its maximum. In fact, *air*,—heavy air,—was the concomitant; the barometer was almost constantly above 30 inches, and *proved* the weight of the atmospheric column. Even in the present arid spring, the dews amount (where my means of observation extend, at least,) to little or nothing; not to one-fourth of that quantity in which they are deposited in ordinary, showery springs, during the fine intervals.

Dr. Wells observed that a very thin, and slight covering, even a muslin handkerchief, stretched at a few inches above the surface of the ground, retained much warmth;—thus, 'one night when the fully exposed grass was 11 degs. colder than the air,' the sheltered grass was 3 degs. warmer:'—from these, and other facts, some philosophers—Dr. Wells particularly—have inferred that—the formation of dew *is the consequence of radiation*,—that cold is the cause of dew, and not dew of *cold*; and it is always found, during the formation of dew, that the surface of the ground is colder than the circumjacent air, owing to its radiation of heat into the atmosphere. The best radiators are soonest dewed; hence, grass and vegetables are more quickly covered with dew than gravel stones or metals; and as the earth dissipates its heat by *radiation*, it will be seen that any *slight awning* spread over the ground will prevent radiation, and keep the earth warm." "Bodies *become colder* than the neighbouring air before they are dewed; and as different bodies project heat

with different degrees of force—"in the operation of this principle, conjoined with the power of a *concave mirror of clouds* or any other awning, to reflect, or throw down again those calorific emanations which would be dissipated in a clear sky, *we shall find a solution of the most mysterious phænomenon of dew.*"

In the last few lines with inverted commas the reader will find a condense of Dr. Well's theory, and in the preceding part of the paragraph, that of other reasoners.

It may be proper to remark that, in the same principle of radiation is to be traced the protecting power of a covering over fruit-trees in early spring.

I agree with these authorities in as far as *effects* are discernable; but I seek *a cause,*—an active agent—which cannot be discovered in their theories. I therefore retain the same opinion which I expressed some years ago, and must now shortly recur to it; and thus, bring the long paper to a close.

I do not question, or doubt, that radiation takes place from heated surfaces, whenever a cooler medium acts upon those surfaces; the ground, whether it be a sandy desert, or a meadow richly clad with verdure, will radiate heat; but how comes it to pass that the latter will become *colder* than the atmosphere which surrounds it?

The radiation alluded to in the theory is supposed to be produced by vegetable organised bodies, and to result from a faculty which they possess of carrying off heat from the earth. But before the reader yields his unqualified assent to this begging of a question, he should reflect upon the peculiar structure of the radiators, and the wonderful electric agencies which are ever in active operation. Vegetables, including herbage, shrubs, and trees,—every pointed termination of their leaves, and their terratures, every leaflet, every prickle and bristle,—all these perform some important offices in the economy of nature: they are "the best of radiators, and become soonest dewed"—but at the same time—be it remembered—they constitute an assemblage of so many points, which are the *very best* of *electrical conductors;* and, probably depend upon the agency of electricity for the propulsion, laboration and distribution of their own vital and secreted fluids.

Why should trees and herbage condense such a vast volume of water? Why should a spot of freshly digged ground be *covered with hoar-frost,* when hard, unwrought ground discovers not one particle of frosty rime, unless it be on spots where some weed or projecting point be standing above the surface? let those answer these questions with calmness, and by philosophical reasoning, who persist in

believing that radiation, without any other exciting cause, effects these miracles! I hesitate not to suggest that the proximate cause of the precipitation of the dew must be referred to the peculiar structure of vegetable bodies,—a structure which constitutes them, individually and collectively, not only perfect instruments of electric conduction, but also an assemblage of myriads of points at which the ascending and descending electrical currents meet and neutralise each other, in exact conformity with the laws of electric induction,—depositing the aqueous particles which, till then, they had held in a state of repulsion, or of infinitely minute division. It does not appear that grass and herbage are endued with the power of radiating or conducting *heat* in a degree by any means equal to that of *metals* —substances which, it is said, *do not become dewed*, at a time, and under circumstances wherein the circumjacent herbage is covered with minute drops of water,—a fact which is not only very remarkable in itself, but one which affords convincing proof that plants *do not become dewed*, solely, *by their power or radiating heat.*

The mysterious phænomena of the Dew and its disappearance, can therefore be solved, by referring them to the conjoint attraction of the etherial electric essence of light, in the earth and atmosphere. *How* this acts, our limited powers of perception may never be able to detect; but in its operation we find a beautiful, and never-failing instrument of attraction, repulsion, condensation and attenuation. We view thereby, *heat* as an effect, produced by the chemical energy of this all pervading etherial fluid: all is harmonious—all is in conformity with fact and experience, and all is magnificent. We therein see how important is the agency of the atmosphere, not only as a vehicle of respiration, but as the solvent of watery vapors, as part of which it simply holds in solution, while that which would be redundant, it assimilates with itself. We see also the beauty and exquisite adaptation of the vegetable organisation, which fits it to be the medium of conduction between the earth and air; in the performance of which, the structure itself is enlarged and its parts developed by growth. I shall not amplify now, for as all must, I conceive, be referred to the agency of light, I shall reserve what remains to be said, to the article which I shall devote to the consideration of that primary and most mighty agent.

April, 1834.

ARTICLE II.—ON RAISING APPLE-TREES FROM SEEDS.

BY J. TRIMMER, ESQ.

As there have, at different times, been several enquiries in your Journal respecting the raising of apples from seed, it may, perhaps, be interesting to some of your readers to know what was my success in a small experiment of that kind.

I collected some apple-pips, all from good sorts of eating apples, and sowed them in the spring of the year 1802. During the first few years, those which came up, were greatly reduced in number by several accidents, and afterwards by being removed to another garden at an unfavourable season of the year, all but three trees were killed, and those much retarded for several years in their growth. Of these three plants, one produced fruit the twenty-second year of its age, and proved a particularly juicy and very fine flavoured fruit, which keeps to the end of November; it is a very abundant bearer, but not a very strong growing or very healthy tree. The second tree fruited the twenty-fourth year, it is a sweet fruit, but there is nothing to render it worth propagating; though I still have the original plant, and it is equal in quality to many sorts still found in old gardens. The third tree produced fruit in the twenty-sixth, and I consider it a very valuable kind, the fruit is of a good size and appearance and evidently allied, by its shape, to the Pearmain. It is pleasant as an eating apple, I know none that exceeds it for boiling; and it keeps particularly well to the end of April without at all shriveling. Out of a good many sorts, it kept this year the best of any that I had: I used the last in the last week in April, and, I do not doubt that many of them would have been good to the middle of May. It is a good bearer, and a remarkably healthy tree. I shall have much pleasure in sending you specimens of each sort for your opinion, in the autumn, and afterwards cuttings for yourself, or such of your friends as may deem them worth grafting with.

I trained, a few years ago, a Nectarine from seed, which fruited either the sixth or seventh year, I am not sure which. The fruit it produced was very like the Roman Nectarine, but I think rather higher flavoured. The flesh parts when ripe, separate very clearly from the stone.

I have stated these circumstances, thinking that, perhaps they might be considered such as to induce others to raise fruits from seed, which must always be the source from whence we derive new sorts.

Brentford, May 17th, 1834.

ARTICLE III.—ON THE CULTURE OF FIGS.

BY MR. WILLIAM GREY,

Gardener, Scotswood, near Newcastle.

The Fig is a fruit of great antiquity, as we learn from ancient history that it was the principal article of food among the inhabitants of the Eastern Countries, before the use of wheat, barley, or any other grain was known. The Fig was cultivated with great care up to the period at which the Spaniards were suspected of giving poisoned figs to their enemies. No doubt an aversion to figs arose at that time, and the best mode of their cultivation was lost.

When I was gardener to Sir Chas. Monck, Bart. Belsay Castle, we had a house built expressly for Figs. They were planted out in the border, in the same manner as vines. Several were in pots and tubs, which were kept in the orange-house, and some on a hot-wall. Fig-trees are most fruitful when planted in a strong hazelly cool loam. Those planted in a light dry soil generally cast the first crop before it is ripe, and shew a second crop on the wood the trees make that season. Trees in the open air, that are subject to casting off the first crop, do little good, for if the second crop be ever so plentiful the season is too far advanced to allow the tree to make wood, and ripen the fruit before the long cold nights set in.

Fig-trees in pots are most difficult to manage, as they are generally kept in a vinery, or some forcing-house. The soil in the pot being of the same temperature as the house, the tree becomes impatient, and if it sustain the least check for want of water, the fruit will, a few days afterwards, drop off. I succeeded best with those I had in pots, by putting them in a strong soil inclining to clay, and pressing it hard among the roots as I potted, placing them in that part of the house where they had plenty of air, and watering them plentifully when the fruit was swelling. I have had excellent crops of Figs from trees against a hot wall. They were planted in a strong hazelly coloured soil. Old Fig-trees are generally most fruitful, as their young wood is, for the most part, short-jointed and spur-like, which is always fruitful. Young trees generally make long jointed luxurious wood, which is not to be depended upon for a crop. After the fall of the leaf in autumn, I cover the Fig-trees on the wall with fern to protect the wood from injury by the frost. About the end of April, I clear away the fern, and nail the branches regularly to the wall. In pruning, I cut out any long naked shoots to give place for the lower branches. The young wood should never be shortened,

as the best fruit is generally on the extremity. All shoots that push out in summer from wood of three or four years' growth, I displace immediately, as they are glutinous and unfruitful. From April to the end of May, I cover the trees on the wall at night with canvass and bass mats, as several of the fruit at that time are as large as Mazagan beans, and the slightest frost would destroy them. During the summer months, I give them plenty of water over the leaves with the engine, thrice a week. Young healthy trees are liable to make a great length of young wood; when that is the case the sap flows too rapidly past the fruit, which thus starves and drops off. This may be prevented, if observed in time. In the month of June, I examine the trees closely, and if the wood is making rapid growth, I ring the part from which the vigorous shoots issue. This immediately humbles the growth of the wood, and the fruit keeps pace and swells in proportion with it.

The Fig-house in the gardens at Belsay-Castle, is of particular construction, being only four feet wide inside, the upright glass in front ten feet high. The border is prepared on the north side of the back wall, the wall being built on arches for the roots to get through. The trees are planted inside, and trained against the wall. There is no artificial heat to the house. The border was prepared with a strong hazelly loam, the soil which I use for melons, taken from the top of a limestone quarry. I never saw finer figs than were produced in that house, particularly the Dwarf Brown Naples, which got to a great size, and could not be exceeded in point of flavour.

May 2nd, 1834.

ARTICLE IV.—ON THE CULTURE OF PEAS.

BY MR. W. TOWNSEND.

In two of your preceding numbers, I have given you an account of the different varieties of the garden Pea, and perhaps it would not be considered altogether amiss to offer a few observations relative to their cultivation, &c. It is, I believe, a general practice for peas to be sown in rows, from two to five feet apart, according to the height which the different varieties grow; a practice of which I do not altogether approve, with the exception of the earliest crops, there being in general but certain compartments suitable for them. The method I have been in the habit of pursuing, is to sow the seeds of the second and after crops in rows, a considerable distance apart, say from twenty to thirty feet, according to the size of the Kitchen Garden, or the quantity required. The interval between the rows is croped

with other vegetables of dwarf growth, such as Broccoli, Savoys, Cabbage, Spinach, Celery, &c. so that there may be no loss of ground. The tall peas when sticked are an advantage rather than otherwise to the intermediate crops when first planted, on account of the shade which they produce, and in addition to which the ground appears always fully croped. It therefore must be admitted, that it adds to the beauty of the Kitchen Garden. By the above treatment the crop is increased fully one-third, and of superior quality. The produce of the common Bean, and also of the scarlet Runner is considerably increased by the above mode of treatment. Respecting the hardiness of the different varieties, I am not at present able to give any decided information; but it has been confidently asserted to me, that some of the Marrows as well as other varieties are equally hardy as the early frame, Charlton, &c. If such is the case, and I have no reason to doubt it, how much sooner in the season might some of the finer varieties be sent to table. However, be that as it may, I purpose to give the different varieties a fair trial, and hope to be able in due season to give you a detailed account of the comparative hardiness of each variety. The sugar peas are not unfrequently, when quite young, gathered, sliced in the manner of Harrüots, French Beans, and sent to table in that state. It perhaps may not be unnecessary to add, that the soil in which the peas grew, as described in your preceding numbers, was a strong rich loam, and I have no hesitation in saying, it is the best kind of soil for late peas, and for early peas I believe a light dry soil will be found to answer best. It is also a general practice, in small gardens particularly, to sow their peas too thick, which is greatly detrimental to the crops. As a criterion, I should recommend, for the earliest sorts, about a pint to every fifteen yards, and for the later kinds the same quantity to about twenty-five yards. The whole of the varieties of grey peas are unfit for garden culture.

ARTICLE V.—A CATECHISM OF GARDENING,

INTENDED FOR THE USE OF VILLAGE SCHOOLS AND COTTAGES,

Containing Plain & Brief Directions for Cultivating every kind of Vegetable in common use.

BY AN OLD PRACTITIONER, LONDON.—1s.

NEXT to the inculcation of religious and moral principles, those of gardening are peculiarly necessary to every grade of rural society. Every individual from the highest to the lowest, has, or wishes to have a garden; the management is as easy as it is rational—as pleasing as it is profitable. It is notorious how very much children de-

light in gardening; and if as a task it were occasionally introduced at school, it might be an incentive to the acquirement of more intellectual knowledge; making the latter less irksome to the tender mind.

Entertaining these ideas, and having before him the example of many academies on the Continent, the author has employed himself in drawing up the following little work. He has chosen the catechetical form in order that it may bear some resemblance to other elementary school books, and that the teacher may give a portion of the questions to be answered by the pupils, as in the case of religion, history, &c. By such exercises, many, if not all the most useful and and common practises may be impressed, and being connected with a view of the operations, they may be fixed on the mind.

The book will be useful to the master as well as his scholars, as enabling him to direct the operations and culture of what should redound to his own advantage, as tenant of the School Garden; and no task imposed by him in the business or care thereof would ever be deemed a hardship by the pupils.

As a remembrancer, and book of reference, it will be useful to every cottager, who is not already sufficiently acquainted with Cottage Gardening: the directions are brief and plain, and can hardly be misunderstood.

Within the compass of 50 duodecimo pages, it contains information on Vegetable poisons; General advice on Gardening, Saving Seeds, General Catechism, and a calender of work to be done in each month.

CULTIVATION OF LEAVES AND LEAF STALKS.

"You have now to enumerate and describe the leaves and leaf stalks used as food: what are they? All the cabbage tribe, lettuce, endive, spinach, white beet, celery, cardoon, rhubarb, lamb's lettuce, sorrel, parsley, mustard cress, and water cress.

What concerning the cabbage? The principal and most useful varieties, are the early York, early dwarf, for first crops; Battersea and sugar loaf, for later supplies; the small red for pickling; and the drumhead and large red for field culture. The early Battersea is an excellent sort for cottages.

At what seasons should cabbage be sowed? For the principal spring crop the seed should be sowed some time between the 25th of of July and 8th of August. If sowed before that time, many of the plants run to seed without heading; and if later, they do not come in soon enough for the table.

Is not cabbage seed sown at other times? Yes: as a succession should be constantly coming in all the summer, another seed bed is

sowed in September, and again in April and June, from which sowings young plants may be had to keep up a supply the year round.

How are the seed-beds made? An open spot or border is chosen, well manured and digged; the seed is scattered regularly, firmly trodden in and raked smooth. As the seedlings rise they must be guarded from birds, and kept from weeds.

Is it necessary to transplant the seedlings to a nursery bed? As it is an advantage to have plants of what is called a stocky, i. e. a stout, low habit, it is good management to prick out all the strongest into a fresh bed, not only that they may have ample room to spread their leaves, but because the underlings in the seed bed will be greatly benefitted by their removal.

How is this part of the business done? There are two modes practised. The first is, to prepare a bed thrice the size of the seed-bed; on this the largest of the seedlings are carefully dibbed, four or five inches apart. Here they stand to gain strength till they are finally planted out in October.

What is the other method? The ground, or a part of it, intended for the principal crop of cabbage, is got ready as soon as the seedlings are fit to prick out. Here they are placed in rows twice as thick as they should ultimately stand—say in rows ten inches asunder, and the plants seven inches apart in the rows. About the 5th of October, all the ground being prepared for the reception of the supernumeraries, each intermediate plant in the standing rows, is transferred to its proper place on the vacant ground, to complete the plantation.

Is there any other way of raising cabbage? Yes, some curious persons sow the seed thinly in drills, and, when the plants are fairly up, thin them to five inch distances; by which treatment they grow strongly, and are in excellent condition to be finally set out in October; but this is a refinement in the cultivation which is not absolutely necessary.

What is the general management and its effects on a plantation of cabbage? The bulk as well as the quality of the crop varies with the character of the soil. In light sandy and moderately rich ground, cabbages are earlier and sweeter in flavour though yielding smaller heads; of course, in very rich land, and all the tribe require rich land, the crop is somewhat later and corresponding larger. But in any ground in good heart, if well digged and prepared, a crop seldom fails, if the plants are hoed among and properly earthed up.

What are the usual distances at which cabbages are planted? The smaller early sorts may be planted in rows eighteen inches asunder,

and twelve inches apart in row; the larger sorts should have two feet intervals between the rows, and eighteen inch distances from plant to plant. The planting may be done as the digging proceeds, which saves treading the ground; or first digged and planted afterwards.

What precautions are necessary in transplanting cabbage? That the plants be carefully taken up; long straggling roots may be shortened; and should the maggot have seized the root or stem, the tubercles must be pared off. In dibbing or planting with the trowel, the plants should be let in up to their lower leaves, and made perfectly firm in their new place. If the ground or weather be dry, give each a little water.

What is the maggot you mention? It is a fly, or beetle, which deposits her eggs within the cuticle of the lower part of the stem, causing deformities called "clubbing" by gardeners, and "fingers and toes" by farmers.

Is there any preventive against this insect? It is found that soap-boiler's waste is useful; and probably, were the seed-beds occasionally watered with soap suds, the parent fly might be deterred from laying her eggs on the plants. Some gardeners make a puddle of earth, soot, and lime, with which the roots are smeared before planting, but this is not always effectual.

When are autumn-planted cabbages fit for use? Generally about the beginning of May following. The forwardest are tied up like lettuce, which serves to whiten the heart. If the plants be true in kind, and have had equal treatment, many come in together; in which case a good plan in using them is not to cut one here and there, but to begin at one side, taking row after row till the whole are used. The advantage of this in a little garden is, that so soon as one row is cleared, the ground may be immediately recropped.

And how is the summer supply continued? By a succession crop from the seed-bed sowed in September, and again from those sowed in April, from the last of which plants may be had to serve till winter.

Are any later sowings made? Yes: a seed-bed is sowed in June to raise what are called coleworts, or open cabbages, during autumn and winter.

Are red cabbages sowed and cultivated in the same way? Yes: nearly so. Sow in August for the summer supply; and again at the end of March, for winter service. Red cabbages require more room than other sorts, and do best in single rows; as in the alleys of other low crops. Though seldom used in cottages, the cottager should always raise a few, as they meet a ready sale in market towns.

What are those greens, of which so many are sold in the London market, called plants? Young cabbage, or coleworts, sowed and planted out at any time of the year, and pulled for sale just before or after they begin to form heads. If quickly grown they are preferred to headed cabbage, being more mild in flavour.

Which is the next variety of this tribe deserving notice? The Savoy; as being hardy and useful, particularly in winter; indeed it is said they are improved by frosts. For a principal crop, the seed should be sown about the middle of April. Defend the seedlings from birds; and prick them out into nursery beds, if there be time and opportunity. At the beginning of July they may be transplanted out for good, on well-digged or trenched rich ground, in rows two feet apart, the plants being dibbed at sixteen inches distance in the row.

Are there different varieties of the savoy? There are three—the green, the dwarf, and the large yellow; the first is the most delicate, but the last is preferred for the main crop.

What is broccoli? A sub-variety of the cabbage, commonly called Scotch kale, of which there are several kinds, as the tall and dwarf green, the brown, the Jerusalem, the Buda, &c. All are hardy and well worth a place in every garden, not so much for the principal head as for the great number of sprouts which rise in succession from the stem. Woburn kale is a distinct variety, being a perennial, and propagated by cuttings from the old stool planted in spring.

What are Brussel sprouts? A sub-variety of the Savoy; the head is inconsiderable; but from the stem come forth a vast number of little compact heads of excellent quality, and for which the plant is chiefly cultivated. This and all the sorts of kale are raised from seed, sowed about the 20th of April, and transplanted into good rich soil, and afterwards managed like cabbage.

What have you to state relative to lettuce? It is one of our principal salad herbs; pleasant, sanative, and easy of culture. As lettuce soon runs to seed, it requires to be frequently sowed in the summer months. For the earliest spring supply, seed-beds are sowed in August, whence a part of the plants may be removed in October into frames, or to some warm dry situation, where they may be sheltered from the north and east winds, and be occasionally covered with mats, dry fern, or branches of evergreen trees, during severe frost.

Do you call these the principal crop? No. The principal crop for summer use is sowed as early in the year as the weather will permit, or in frames under glass, from whence they are planted out for good, when the leaves are about three inches long, and the

mild spring weather allows the tender plants to be set abroad. The rows should be twelve inches asunder, and the plants about nine inches apart in the rows.

What is further to be observed in growing lettuce? That they are planted on very rich ground which should be frequently hoed; and when the plants have nearly attained full size, the forwardest should be tied up to assist whitening the heart. Sometimes this crop is sowed thinly in shallow drills; the supernumeraries are drawn for transplanting, which prolongs the supply from one sowing.

Is it not usual to sow lettuce with other crops? Yes; both the coss and cabbage sorts are sowed with spinach, in August, and the former among onions in March. Those sowed among spinach are intended for transplantation, if they survive the winter; and those raised among onions are drawn for use as soon as fit, or when they damage the onions.

How many sorts of lettuce are cultivated? About twenty varieties; but the hardy white, hardy green, green, and Egyptian coss kinds, are the best for common use. The brown Dutch, common white, and grand admirable cabbage sorts, are preferred for kitchen use. All are used as salad herbs, in every stage of their growth; but the larger and whiter hearted the coss varieties are, the more they are prized.

Is not endive allied to lettuce? No, notwithstanding their properties and uses are alike, endive is less crisp and more bitter than lettuce; but it is capable of being beautifully blanched; and thereby becomes palatable; it is also more hardy than lettuce, and therefore, is chiefly used in the winter months.

When should endive be sowed? If sowed early in the year, the plants soon run to seed. The middle of the months of June, July, August, and September, are the proper season for sowing, in order to have a full supply through the autumn, winter, and spring. Whether the plants remain in the seed-bed, or are transplanted in rows into fresh beds, they require at least twelve-inch spaces, as the leaves spread widely and close to the ground.

How is it blanched? By tying the leaves together like lettuce, or by earthing up the full-grown plants with dry soil, or by placing them during the month of October in raised beds of dry sand, the leaves being gathered up, and laid close together, to be guarded against rain and frost by mats or frames, or they may be so stored in sheds. As salad herbs form no part of the cottager's fare during winter, endive is of little value in his garden. There are four varieties of this plant, the white curled and the white Batavian being the most desirable.

What is the use and culture of Spinach? The leaves are a delicate green, and much used in superior cookery. Where a constant supply is wanted, the round-leaved variety is sowed on large beds, broadcast and in drills, monthly, from January until August. The seed is well trodden in before the ground is raked. When the seedlings are an inch or two high, they should be hoed to five-inch distances, and kept always free from weeds.

Is there another variety? Yes; the prickly seeded, of which the principal and largest sowing is made about the 10th of August. This yields the winter and spring supply, the leaves being repeatedly picked or cut from the plants. Even to the cottager, a bed of spinach may be profitable, as it is a pleasant addition to the rasher, when turnip-tops are scarce, or before the cabbage comes in.

Are there any other spinacious plants? Yes, there are two, viz, New Zealand spinach and the white beet. The first is only cultivated in gentlemen's gardens, and managed much as ridged cucumbers are; though if sowed in May, in the open ground, and allowed to ripen and it's seed, which it will do in autumn, plants will come up plentifully in the following summer. The second is a substitute for spinach when nothing better can be had. Ten or twelve good seeds of the white beet, dropped in a drill, on well manured ground, are sufficient for a small garden.

Do you rank celery among eatable leaves? Yes; because leaf-stalks are the parts eaten, as far as they are blanched.

What management does celery require? It being both a salad and kitchen vegetable, much pains are taken to have it large, lasting, and good. If the seed be sowed too early in the season, the plants are liable to run; and if too late, they do not arrive at a full size.

When should the seed for the main crop be sowed? At twice in the month of April, viz, about the 4th and 20th. The seed-bed should be on a warm spot, and as soon as the seedlings are fit to handle, they should be pricked out on a rich well-prepared nursery bed, there to gain strength till planted in trenches in July. The earliest crops, i. e. those raised in January and February, are generally sowed and nursed in hot-beds, and go into trenches in May and June; but these require using as soon as they are of sufficient size, as they quickly produce flowering stems.

How is celery blanched? In two ways; the first and most common is by forming trenches parallel with, and four feet distance from each other; these are made twelve inches wide, and, if the staple allows, as many deep; the soil taken out is spread on each side the trenches; the latter then receive a layer of very rich rotten dung, which is

digged in along the bottom, and covered with the earth turned up by the spade, on this the plants are dibbed in along the centre, six inches apart, and immediately receive a good drenching of water.

How is the second method executed? A trench, five feet wide, having margins of four feet on each side, is digged out to the depth of one foot, the bottom of this sunken bed is covered with a coat of rich moist rotted dung, and digged in; on this the plants are put in cross rows, one foot asunder, and the plants six inches from each other in the rows.

And how are the plants moulded-up? As the plants advance in height, those in the single trenches are moulded-up by having the sides of the trenches shovelled gradually down against the leaves. This work is best done in dry weather, and repeated once a week, till in the end of October. When the green tops are only exposed, and the mould banked and firmly patted slopingly up on each side, which serves as a defence against rain as well as frost; this finishes the culture. The spaces between the rows in the wide trenches are in the way filled up between the plants, as the latter rise in height, by well broken mould taken from the sides till the bed is three feet high, and should severe frost set in, the whole may be covered with mats or dry-litter.

How late in the year may celery be planted out? Until September; but the trenches may then be shallow, as the plant grows but slowly after that time.

Is not celery naturally a water plant? Yes; but unless it be cultivated in the way above described, it would retain so much of its natural bitterness that it would not at all be relished.

Are there different sorts of celery? There are eight varieties; but the solid white, red and giant kinds are most esteemed. A distinct variety called celeriac, or turnip-rooted, requiring no blanching, is also in cultivation, useful in soups, &c.

What are cardoons? A species of artichoke, the leaves of which being tied together and earthed highly up, blanches the leaf-stalks, renders them palatable and fit for salads, and soups in Italian cookery.

Do you include rhubarb among your edible leaf-stalks? Certainly; because this celebrated medicinal plant is cultivated and is an useful vegetable for pies, puddings, and tarts; answering the purpose of green fruit, at a time when no green fruits are to be had. For family use, and particularly for children, rhubarb puddings are as economical as gratifying; and no garden should be without eight or ten plants, which will thrive in any bye-corner.

Which are the best varieties for this purpose? All the varieties

are used, viz., the rhapontic, the hybird, and the palmated; but new varieties are often raised from seed, one of which, having remarkably large leaves and stalks, called the Goliah, is greatly prized. Rhubarb may be raised from seed or by division of old roots; it also bears forcing well; old roots, thickly crowded into large flower pots or shallow tubs, and set any where to receive a suitable share of heat, will give their leaves abundantly.

What other leaves remain to be noticed? Besides all the different sorts of pot-herbs, hereafter to be noticed, there are two other plants, the leaves of which are used at table, viz., lamb's lettuce, or corn salad, and orache, used as spinach. Corn salad is sowed in August and September for winter and spring supply, and in every other month, to secure a succession as an ingredient in salads; neither bulk nor other quality to recommend it. Orache is sowed in the spring, and yields its leaves in the summer; but is considered an inferior vegetable, and not to be compared to the young sprouts from cabbage stalk.

ARTICLE VI.

OPERATIONS IN THE FRUIT AND KITCHEN-GARDEN

FOR JULY.

FRUIT DEPARTMENT.

Apple Trees.—Gather off the caterpillars in webs, with the hand, and wash the trees with good soap suds, if it can conveniently be done.

Budding may be performed on many fruit trees; take advantage of cloudy weather for the purpose, or do it early in the mornings or late in the evenings.

Cherry Trees are seldom much troubled with aphides this month, but should it be the case, they cannot be interfered with whilst the fruit is ripening, or the flavour will be damaged; but as many of the earlier sorts will be gathered, mix some tobacco water with strong soap suds, and apply it warm with an engine, and the insects will soon disappear.

Peach and Nectarine Trees infested with the aphis and red spider, should be washed with the following mixture. To three bushels of quick lime, and three bushels of soot, add twenty gallons of soft water, stir these up for several days, and take off the scum as it rises; then take the clear liquor, and add one quart of good tobacco-water to every two gallons of the liquor, and about a quarter of a pound of

sulphur; the last need not be used unless the trees are infested with the red spider. Syringe the trees once or twice a week in dry weather. Wash the trees occasionally with soap suds. All these operations must be discontinued, when the fruit begins to ripen.

Pear Trees, during this month, are often infested with a number of small larvæ, probably of the saw fly family, which feed upon the upper rind and pulp of the leaves. To destroy them, add a bushel of quick lime to ten gallons of water, and stir it up for a day or two. When settled, wash the tree with the clear liquor by means of an engine or syringe.

Plum Trees.—Thin the fruit, and use them for tarts. If the trees are infested with aphides, wash them with good soap suds, and strong tobacco water.

Summer Pruning must be attended to.

VEGETABLE DEPARTMENT.

Beans.—Put in a few mazagans and long-pods, about the 1st and the 10th.

Broccoli transplant in dripping weather, and sow some Green Cape, and Early Purple Cape, to produce next April.

Cauliflowers planted out will come into use in September.

Celery should be planted in trenches.

Cabbage.—Sow about the 1st and 15th for use, as coleworts in spring.

Endive.—Early sown endive now planted out will be ready for use in September. Sow more seed about the first and second weeks for later crops.

Garlic and Shallots will be ready to take up, select dry weather for the purpose.

Lettuces now sown come into use in October.

Leeks should be transplanted, in rich soil, six inches apart.

Mushroom beds now made come into use in August.

Onions should be taken up in dry weather.

Peas for late crops, should not be sown later than the middle of the month.

Raddishes.—The short-top may be sown every ten days, and turnip rooted twice in the month.

Spinach.—Sow round-seeded twice during the month.

FLORICULTURE.

ARTICLE VII.—LONDON HORTICULTURAL SOCIETY.

The anniversary Meeting took place on the 1st of May, but it was exclusively devoted to the election of the council &c. for the ensuing year. The finances of the Society appear to be in a more flourishing state, and a very satisfactory account was rendered by the Auditors in their report. The surplus income for the past year over the expenditure amounts to nearly £1600, and before the day of balance, two bonds amounting to £920 had been paid off. One of the customary Meetings took place on the 6th, but there were not many articles of high merit brought forward, every thing of much interest apparently being reserved for the 1st. exhibition at the Garden on the 10th, which was extremely beautiful. Not much fruit was on the tables, on the latter day, but the collection of flowers, we should think, could not be surpassed, either for the fineness of the individual specimens, or for their combined effect.

The weather was most propitious, which together with the excellence of the shew and general arrangements caused much gratification.

The numerous specimens of Cactus were much admired, as was also a lovely species of Xeranthemum from Swan River. The Judges selected for awarding the prizes were Mr. J. A. Henderson, Nurseryman, Mr. Richardson, Gardener to the Earl of Tankerville, and Mr. Forrest, late Gardener to the Duke of Northumberland. The following were the successful competitors, and the Medals which were adjudicated.

The Gold Banksian Medal.—1. For a Collection of Stove and Greenhouse Plants, exhibited by *Mr. Green,* Gardener to Sir E. Antrobus, Bart. 2. For Grapes and Pine-Apples exhibited by *Mr. Dowding,* Gardener to Lady Clarke. 3. For a miscellaneous Collection of Plants from *Messrs Rollisson's,* of Tooting.

The Large Silver Medal.—1. For Stove and Greenhouse Plants, exhibited by *Mr. Falconer,* Gardener to Archdale Palmer, Esq. 2. For Grapes, from *Mr. John Wilmot,* of Isleworth. 3. For Azaleas, from *Messrs Waterer,* of Knap Hill, Ripley. 4. For Pelargoniums, from *Messrs. Colley and Hill,* of Hammersmith. 5. For a miscellaneous Collection of Plants, exhibited by *Mr. S. Snow,* Gardener to J. H. Palmer, Esq. 6. For a miscellaneous Collection of Plants, from *Mr. Gaines,* Surrey Lane, Battersea.

The Silver Banksian Medal.—1. For a Collection of Heartsease, from *Mr. Salter,* of Shepherd's Bush. 2. For Cucumbers,

from *Mr. George Mills,* Gardener to Alexander Copland, Esq. 3. For a miscellaneous Collection of Flowers, from *Mr. G. Mills.* 4. For a miscellaneous Collection of Flowers, from *Mrs. Lawrence, F. H. S.* 5. For a miscellaneous Collection of Flowers from *Mrs. Marryat, F. H. S.* 6. For Forced Apricots and Raspberries, from *P. C. Labouchere, Esq.* 7. For a Plant of Boronia Serrulata, from *Mr. Douglas,* Gardener to the Earl de Grey. 8. For Citrons and Shaddocks, from *Peter Fry, Esq.* Compton House, Somersetshire.

ARTICLE VIII.

CULTIVATION OF THE NATURAL ORDER PROTEACEÆ.

"In the first place it is necessary that the pots should be well trained; for which purpose, place over the hole in the bottom, a piece of potsherd; then place another piece against it, so as to leave a hollow; after that, put in a handful of potsherds, broken into pieces not larger than peas, and over these pieces still smaller, till the pot is nearly one third-part full. This is applicable to the management of plants of almost every family; for by these means, the water soaks gradually off, and the mould is not allowed to get sodden.

In the next place, for the genera Protea, Leucadendian, Leucaspernum, Spatalla, Sarocephalus, and Aulax; all the species delight in a composition of rather more than one-third sand, and the rest light loam without any peat. The genera Surruria, Nivania, Grevillea, Hakea, Petrophila, Isopogon, Banksia, Dryandra, Lamatia, and Telopea, succeed best in three parts of peat, two parts loam, and one part sand. When potted, they do not require any particular care more than other greenhouse plants, except to let them have plenty of air, to avoid letting them flag for want of water, and never to water them over the leaves in cloudy weather.

With regard to their propagation, let the wood be first ripened, then take off the cuttings as nearly as possible between the last and present year's shoot, pare them smooth, and plant them in a pot of sand, not too close together, as they are apt to get the damp amongst them, which readily spreads from one to another. Let the pots be then placed in the propagation-house, watering them whenever they want it, but not over the leaves. In this way Mr. Sweet has never found any of the supposed difficulty in striking any of this natural order; and even Telopea, the Embothrium speciosissimum of the Botanical Magazine, he finds to strike as readily as any."—*Botanical Magazine.*

ARTICLE IX.—NEW AND RARE PLANTS,

FIGURED IN THE PERIODICALS FOR JUNE.

CLASS I.—PLANTS HAVING TWO COTYLEDONS.

PAPAVERACEÆ.

Eschscholtzia crocea, Saffron-coloured Eschscholtzia. In general habit, foliage, and size of flower, this new species closely resembles the E. Californica, introduced by Mr. Douglas on his first expedition, and now so generally admitted to be one of the most beautiful additions to our hardy ornamental plants. The present species, however, promises far to surpass even that, in the rich orange colour of the petals. It appears to be equally hardy, and, judging from the experience of a season, to flower still more freely. —*Bot. Register.*

Platystemon Californicum, Californian Platystemon. A native of California, whence it was sent by Mr. David Douglas. It is, however, again lost to our gardens.—*Bot. Reg.* The flowers are yellow.—*Bot. Register.*

RANUNCULACEÆ.

Pæonia Moutan; albida plena. Double White Tree Pæony. This noble variety of the tree pæony was raised by the Earl of Monntnorris from seeds of P. papaveracea, saved at Arley Hall. It differs from the original in being semi-double, and in having narrower, and more lacerated petals.—*Bot. Register.*

ARISTOLOCHIÆ.

Aristolochia Chilensis, Chilian Birth-wort. This is an herbaceous plant, growing in stony places near Valparaiso and Quillota. It is hardy enough to bear our climate, if protected from wet, and the severest cold in winter. It may no doubt be increased readily by cuttings, and may soon be expected to become common.—*Bot. Register.* The flowers are greenish purple.

POLEMONIACEÆ.

Gilia Achilleæfolia, Milfoil-leaved Gilia. A new hardy annual, sent from California, by Mr. Douglas. The flowers are purple instead of sky-blue. It will grow in any kind of soil, and produces seed in abundance, so that it will soon become as common as G. capitata.—*Botan. Register.*

SCROPHULARINEÆ.

Linaria Dalmatica, Dalmatia Toad-flax. Seeds of this handsome plant were gathered in Persia. The shoots and the leaves are covered with a dense bloom, which contrasts agreeably with the deep yellow of the showy flowers.—*Bot Register.*

Calceolaria purpurea, picta, Painted Slipperwort. An accidental variety of C. purpurea, stated to be first raised by Mr. Wheeler, nurseryman, at Gloucester. It differs from purpurea in nothing but colour, and the greener hue of the whole herbage. Its copious delicate white blossoms, marked with a broad purple band, render it an agreeable addition to the already numerous cultivated varieties of this genus.—*Sweet's Fl Gard.*

CAMPANULACEÆ.

Lobelia polyphylla, Leafy Lobelia. This plant is a native of the hills about Valparaiso, in Chile. It was introduced about four years ago, by Mr. Bridges, and more recently by Mr. Cuming.—*Sweet's Fl. Gard.*

LEGUMINOSÆ.

Colvillea racemosa. –Splendid Colvillea. This truly splendid plant is probably a native of the east coast of Africa: but was only seen by Professor Bojer, in 1824, in the Bay of Bombatoe, on the western coast of Madagascar, where a single tree was cultivated by the inhabitants. That indefatigable naturalist raised it from seeds, which he took to the Mauritius, where it has perfectly succeeded; and we may soon expect to add this most ornamental plant to the stoves of our own country.—*Botanical Magazine.* The flowers are rich orange.

Gastrolobium retusum.—Blunt-leaved Gastrolobium. This pretty little shrub was first raised at the Botanic Garden, Edinburgh, in 1831, from seed brought home from New Holland, by Dr. Lang. *Bot. Mag.* The flowers are orange coloured, and the plant will require the shelter of the greenhouse, and the same treatment as other plants from the same country.

THYMELEÆ.

Pimelea hypericina.—Hypercum-leaved Pimelea. An ornamental, slender shrub, rising three or more feet high. A native of King George's Sound, where it was discovered by Mr. Baxter. When treated as a hardy greenhouse plant, it thrives vigorously, and in its season puts forth its flower-heads in abundance.—*Bot. Mag.*

CLASS II.—PLANTS WITH ONLY ONE COTYLEDON.

ASPHODELEÆ.

Milla Uniflora, Single-flowered Milla. This plant is a native of Buenos Ayres, whence it has been lately introduced.—*Bot. Mag.* The flowers are a blueish white.

ARTICLE X.

OPERATIONS IN THE FLOWER-GARDEN FOR JULY.

Auriculas.—Sow the seed as soon as it is ripe, and pot the old plants, which produced it.

Azaleas should be propagated by cuttings of the young wood, planted in sand under a hand glass.

Rose Trees should be budded. Those infested with aphides, should be syringed with a mixture of tobacco water and clear lime and soot water.

Ranunculuses, &c. must be taken up and spread in a dry airy place, previously to being laid by. Roots now planted will flower in October.

Tigudia pavonia.—Seedlings transplanted on a hot-bed may be fully exposed to the air.

Lemon and Orange Stocks may be budded towards the end, if the bark will rise freely.

Greenhouse plants of most sorts, may be propagated by cuttings. Those placed out of doors in pots will require a good supply of water.

Violets may be readily increased by the young shoots, which are plentifully striking root at this time.

Late Annuals.—The hardy sorts sown in the beginning of the month, will come into flower the end of September.

Dahlias may yet be propagated by cuttings. The old plants will also require striking.

Rose Acacias may yet have their shoots shortened, to push anew for flowering in the Autumn.

Carnations.—Transplant seedlings six inches apart, in an open airy situation, in fresh light earth. The flowering plants may also be layered, or cuttings may be planted under a hand-glass.

Calceolarias should have a top-dressing, and cuttings should be planted in sandy peat and covered with a hand or bell-glass.

Rockets.--As soon as they have done flowering, cut down the stems nearly to the ground, to induce shoots to grow for cutting.

ARTICLE XI.—THE FLOWER-GARDEN,

Or Monthly Calendar of Practical Directions for the Culture of Flowers.

BY MARTIN DOYLE,

Author of "Hints to Small Farmers," "Practical Gardening," &c. &c. 12mo. 170 pages. 2s.

THIS little work will be found very interesting to ladies who are fond of flowers. The author scarcely enters so fully into the minutiæ of

the culture of many flowers as we could wish, and although we think its utility will not be equal to that on Practical Gardening, noticed Vol. 2, page 321; it will assist in spreading a taste for the culture of flowers, and serve as a pretty correct guide on many important points. We, therefore, think it deserves to be well circulated. We give the following extract.

WORK TO BE DONE IN THE FLOWER-GARDEN IN JULY.

Take up those bulbous roots which have ceased flowering—Hyacinths, Tulips, Martagon Lilies, and such bulbous Irises as are out of flower. Ranunculus and Anemone roots, which have now lost their foliage, may also be taken up.

SEEDLING AURICULAS.—Which came up last spring, should now, if not before done, be potted, and placed in a shady situation, watered moderately, and kept free from snails and slugs.

CARNATIONS AND PINKS—This is still a good season for propagating these charming flowers, by either of the modes directed in June, but this work should not be postponed to an advanced period of the month. As soon as the shoots are strong enough to layer down, let them be put out. The latter end of this month and beginning of August is the usual season for layering Carnations, which, however, may be done earlier, if the plants are sufficiently advanced in growth; the new plants from those early layers will be more vigorous, and better able to endure the severity of winter than those of a later season. In detaching them, it will be necessary to cut them close under the joint from which the roots have been produced, and from which the tongue had, in the first instance, been cut; the young plants may now be potted, and with the shelter of a frame, will in a few days be sufficiently established to bear exposure in the open air. In the space of a few weeks, it will be found that layers thus treated, will have formed a quantity of root from the other half of the joint, where they had been attached to the present plant; and they will not only be equally sound and healthy, but much more luxuriant than plants produced by piping.

The operation of layering is very simple, and is done by first stripping the leaves from the second or third joint of the intended layer, then introducing the blade of a very sharp penknife at about a quarter of an inch under the joint, and cutting half way through the layer up to the joint, but not into it; the knife is to be drawn out, and the tongue so produced, cut away neatly under the joint, but so as not to wound it, or the layer will not root. The future fibres or roots of the new plant proceed from the joint itself, therefore any injury

to it will prevent their formation. The old mode of cutting up through the joint is not only useless, but injurious, causing an unsoundness and canker. For this reason, plants produced by piping are preferred, being more healthy and sound, which, although the layers may have rooted, will probably destroy them during the winter; the layers are then to be pegged down, with care not to crack them at their junction with the mother plant, and thinly covered with light rich compost, for if they are deeply buried, they root badly and with difficulty, the access of air being necessary to promote the free production of fibres. The points of the leaves of the layers must be preserved uninjured, and not cut off or shortened, as is the usual practice, or you will deprive the plant of a necessary means of support, the leaves of plants being as essential to their vitality as lungs are to animals. In five or six weeks from the formation of your layers, they will be rooted and may be removed from their parent stems.

The Carnation blossoms are now advancing fast to maturity; those which are very double and inclined to burst, should have the flower pods either tied neatly with bass mat, previously wetted, or supported by circular cards, with holes punched in the centre, to fit the pods; and these should be cut with a very sharp penknife through each of their divisions to the base, taking care not to injure the petals. This process permits the flowers to expand evenly, and the cards not only preserve the blossoms in their natural form, but also aid materially in increasing the duration of the bloom. The Carnations, if in beds in the open ground, and unprotected by canvass or other substantial covering, should have their blossoms guarded from the sun and rain, by umbrella shaped pasteboard shades, which may be attached to the stakes supporting the blossoms; but if it cannot be conveniently done, they should be fixed to pieces of slit lath, placed in the ground in the most advantageous positions to afford shelter to the blossoms.

MIGNONETTE.—If you desire to have Mignonette in blow at the latter part of the floral season, you ought to sow it now.

ROSES AND JASMINES.—The layering and budding of Roses and other shrubs may now be performed. Some species of the Rose do not freely yield suckers, and must therefore be propagated by layers.

The stocks for budding may be taken from the suckers of the most common kinds. The common dog-brier, from its superior vigour, is the most desirable stock. Jasmines are principally propagated by budding, and the common white kind is the most usual stock.

PROPAGATION OF CHRYSANTHEMUMS.—The suckers which at this season have attained the height of twelve or more inches, may

be now parted and planted in separate pots, in a compost of equal parts of leaf mould, garden soil, and rotten dung; they will make fine blooming plants for November or December. When they are strongly rooted, cut away the centre or heading shoots, to let the plants push out side shoots, and form a bushy and well shaped head, while they, at the same time, preserve the dwarf size, which is desirable, if the plants are grown in pots.

Cuttings rooted early in the month, with a little bottom heat, will also make pretty dwarf growing plants to flower in autumn.

TREATMENT OF DAHLIAS.—These are now coming into flower, and will require the support of hoops, or of the triangular sticks described in the preceding month.

The general work of this month consists principally in watering and tying up plants, and in weeding.

WORK TO BE DONE IN THE GREENHOUSE.

Syringe and water Camellias and Oranges frequently, and shade them from hot sun.

Plants potted in peat, as are most of our Cape and Australia ones should be carefully examined every day, lest they should become too dry, for peat is so little retentive of moisture, that they will require frequent watering. Take cuttings of your greenhouse plants, if you have not taken a sufficient supply in June, and plant them in a bed, shaded during the day by the hoops and coverings already recommended. The very tender succulent ones should have a mild hotbed, but all the Geraniums, Myrtles, Jacobeas and Cape shrubs, will freely root themselves in a bed of rich earth in open air; exposure to nocturnal dews in either case is desirable.

Remove insects from the leaves, which are now peculiarly liable to injury from them.

Give abundant air to the greenhouse.

Shift seedlings accordingly as their growth requires it, from smaller to larger pots; water and shade them until they have rooted.

EXOTIC SEEDS.—Gather and save seeds as they become ripe, and spread them in dry places to harden; afterwards preserve them in their pods.

The most Ornamental Herbaceous Plants in Flower.—Double Rose Campion, Hollyhocks, Spiderwort, Campanulas, Scarlet Chelone, Blue Catananche, Dragon-Head, Rudbeckias, Coreopsis, Gentian, Eryuga, Spirœa Trefoliata, Perennial Sunflower, Hemerocalis, Iris; Lilies, White, Orange, and Martagon, Lilium Japonicum, Veralrum, Phlox, of various sorts, Escholtzia, Cardinal Flower,

Monkey Flower, Œnothera, Monarda, Potentilla or Cinque-foil. Penstemon, Feather-Grass, Verbascum, German Catchfly, Scarlet Lychnis, Scarlet Geum, Perennial Larkspur, Blue Catananche, Dahlia, Menganthes, Campanula Pyrymidalis, Gladiolus Cardinalis, Holand, Lupinus, Polyphylus, Potentila, Lathyrus Grandiflorus, Sea-Holly, Water-Lily, Ixia, Stapelia, Gladiolus, Psittacinus.

Ornamental Greenhouse Plants in Flower.—Sensitive Plant, Nerium Splendens, Escholtzia Californica, many Ericas, Acacia, Wax Plant, Haya Carnosa, Double Red and Double White Lily, African Lily, Agapanthus, Begonia Evansiana, Commelina, Gardenia, Melaluca, Neurumbergia Phœnicia, Double Pomegranate, Psidium Catleyanum, Cape Trumpet Flower, Bignonia Capensis, Tuoma Capensis, Single Oleander, Double Red and White Oleander, Verbenum, Fuchsia, Calceolaria, Double Nasturtium, Metrosideros, Jasmin, Melalcuca, Chironia, Agapauthus, Balsams, Ice Plant, and the whole tribe of tender annuals.

Shrubs.—*Roses.*—Although the greater part of the Rose tribe flowers has passed away with the last month, there are many varieties of the Chinese, Bourbon, Musk and Damask species, still in bloom. Yellow Broom, Spanish Broom, Aristolochia (a beautiful climber,) Azalea, Rhododendron, American Canothus, Virginian Ilex, St. John's Wort, Cytisus Capitalis, Double Bramble, white and red, Lupine tree, Menziesia, Buddlea, Myrtles, Jasmines, &c.

Climbers.—Japan and Chinese Honeysuckles, Passion Flower, Clematis, Eccremorcarpus.

RURAL AFFAIRS.

ARTICLE XII.—THE PRACTICAL IRRIGATOR AND DRAINER.

BY GEORGE STEPHENS,

Land-Drainer, and Member of the Nerician and Wermlandska Agricultural Societies, Sweden.—Third Edition.—8vo.—8s. 6d. Boards.

This work may without hesitation be pronounced the best on the subjects hitherto published. And this edition of it is superior to those which have preceded it, inasmuch as it contains many important additions and improvements. The whole is divided into short, practical essays, written in a plain sensible manner, containing the General Principles of Irrigation, the Formation of Water Meadows, Catch-Work Irrigation, Management, The advantages of Irrigated Meadows, Irrigation in Scotland, Draining, Straightening

Water-Courses, Protecting River Banks, Embanking Lands, Draining in Sweden, Illustrated with nine copper-plate engravings, besides several wood-cuts, illustrative of the plan of forming water meadows and draining, on Mr. Stephen's principle.

DRAINAGE OF SOILS, COMPOSED OF ALTERNATE BEDS OF CLAY AND SAND-RIDGES.

Soils composed of an intermixed variety, and when clay predominates, are attended with much greater difficulty in draining than those in which both the surface and internal strata are more regularly disposed. In such soils, where every reservoir of water is unconnected with one another, being separated by means of clay beds or dykes, the partial collections of water which they contain are so much augmented in rainy seasons, as to be filled to the level of the surface of the surrounding clay, which it overflows, and renders it so wet and sour, that all kinds of crops are stinted in their growth. As these sand ridges have no communication with each other, a separate drain is required from each in order to reduce the water in them. The outlet drain must be made from the lowest part of the field to the sand ridge situated at the highest and most distant part, and to be carried in such a direction as to touch, if possible, some of the intermediate sand ridges, (as shewn in plan 7,) whereby a considerable extent of drain will be saved. From the outlet drain, branches must be carried to each of the sand ridges, which, when made sufficiently deep, will draw the water from them, and prevent it wetting the adjacent surface. Although the water oozes out all the way round the sand ridges, a sufficiently deep drain on the lower side will, in many cases, extract the water from both sides; but when the ridges are of considerable extent, and the sand of a very fine quality, so as not to allow the water to pass through it freely, the drain must be continued all the way round.

In many cases, the whole of the wetness proceeds from the water in the upper sand ridge passing over the intermediate spaces of clay, and through the different ridges below. When this happens, the drainage of the whole field may be accomplished with much less difficulty than in the former instance. After the outlet drain has been made the upper drain must be cut, which will intercept the water, and may, by this means, render the lower drains unnecessary. It is evident from this, that the water breaking out of the sand ridge in the highest part of a field, may be the sole cause of injury to a considerable extent below; it is, therefore, expedient, in draining land of this description, that the water in the upper side of the field should be first cut off, and its effect ascertained before any more drains are made in the lower part.

There are other soils of a similar nature, the drainage of which is easier accomplished, on account of their alternate beds of clay and fine sand lying much more regular. Under the alternate beds of clay and fine sand, which are often almost parallel to one another, is generally found an impervious body of clay, which keeps the veins of sand full of water, moistening the adjacent clay and running over it. As the main body of clay is seldom more than four or five feet below the surface, a drain must be cut to that depth through the middle of the field, if it has a descent from both sides; and if the ground declines all to one side, two drains will be required, the one near the upper side, to cut off the water coming from the ground above, and the other near the lower extremity or lowest part, where the water in the different beds of sand will easily discharge itself. This, no doubt, will answer the purpose effectually—as the drains cross the different beds that contain the water, they will draw it from each, unless the field is of considerable extent, or have more hollows than one, in which case a drain must be made through every hollow. In draining land of this kind, there is seldom any need for using the auger, as the necessary depth of the drains reaches the impervious body of clay, the thickness of which being so great, that any water that is confined below will do no injury to the crop.

Another description of land to which nearly the same treatment may be applied, is when the soil and sub-soil, to the depth of three four feet, is entirely porous, having under that a strong body of retentive clay; the rain water falling on the surface subsides till it meets with the clay, and then being obstructed from farther descent, the whole mass of porous soil above is filled with stagnant water, which not only retards the operations of agriculture, but also vegetation. To remedy this, it requires only one or more drains, according to the situation of the field; and these require to be made no deeper than to reach a few inches into the clay, between which and the porous soil the greatest part of the water remains stagnant, although it does not appear on the surface. If the land has a small descent from both sides, a drain cut through the porous soil into the clay in the hollow will effectually draw off the water; but if the surface is undulating, as is often the case, it is necessary to make a drain winding through all the lowest places, and when it is almost level, or inclining to one side, the drains must be made across the slope, to some convenient outlet in the side of the field, taking care, in running them, to give as much fall as that the water will run without standing still in their bottom. A particular account of the general dimensions and method of making drains adapted to such soils, will

be found under the head of Rumbling Drains. Much land of the above description, in various districts of this country, may be completely drained in the same manner, at a very moderate expense, by a proper attention being paid to the situation of the ground and cause of the wetness. Such land remains so long wet in spring before it can be sown, that the crop is either obliged to be cut green, or, in some instances, is lost altogether.

DRAINAGE OF CLAY-SOIL INJURED BY SURFACE WATER.

Owing to a considerable portion of the ploughable land in this country being injured by surface water, or water lodged between the soil and sub-soil, systems as various as the effects they produce have of late been applied to drain such, and it therefore becomes a matter of the greatest importance that some definite rule be laid down, whereby a complete and permanent drainage may be effected in such land, and which at the same time, will be attended with the least expense.

Tenacious soils are much more expensive to drain than any other, as the drains must be more numerous, in consequence of having to be laid out in such a manner as to collect all the water from the surface, which, from the imperfect viability of the clay, must, in many cases, discharge itself into them from above; and where there is any irregularity on the ground, the water will remain standing in the hollows if a drain is not carried through each of them. Drains for removing surface water from such land, when it lies flat, should therefore go through the hollowest parts of the field, without any respect to straightness or regularity, and at such a distance from each other as will keep the surface of the land dry. When the soil and sub-soil are composed of strong clay, twenty feet between the drains may be fixed on as a general rule at which they will act; but when the clay is mixed with thin veins of very fine sand, which is very often the case, thirty feet will answer completely. When the ground, however, has the least declivity, the drains should always be directed obliquely across the slope, or as directly across it as the nature of the surface and outlet will allow: the distance of one drain from another, in this case, depends on the declivity, the preparation of sandy substance mixed with the clay, and the depth of the drain. Where the soil is very tenacious, and the declivity considerable, the drains will not act more than twenty or thirty feet; but where it is mixed with thin strata of fine sand, although the sand is hardly perceivable, the same depth of drain will act several times that distance. The necessary dimensions of drains for removing surface water is found, from experience, to be from two and a half, to three feet

deep, sixteen inches wide at top, and twelve inches at bottom; and they should be filled with stones, broken to the size of road metal, in arable land, to within twelve inches of the surface of the ground; and in permanent pasture, such as lawn and pleasure ground to within two or three inches of the surface of the ground. In all cases, after having covered the stones with some straw or turf, the remaining space should be filled with porous earth or sand, which, if it cannot be found near the drain, should be carted to it, as they will be rendered useless if the impervious clay is again thrown into them.

In coarse lands, where the ridges are generally very high and winding, the furrows between them, during a great part of the year, are mostly full of stagnant water, which, in many instances, destroys the crop half way up the ridges, the declivity of the surface of the land being insufficient to carry away the water. In such cases, drains are required in almost every furrow, according to the breadth of the ridges. They must be made about twenty inches deep, and the breadth of a common garden spade, and filled up with small stones, or coarse gravel to within four inches of the bottom of the furrow; and if the land is very tenacious, the remaining space must be filled with porous soil. This practice, however, can only be recommended on coarse and other land of a similar nature; for it is evident that water within the earth, or on the surface, seeks a level where the fall through the porous soil is greatest; therefore a drain made across the slope or declivity of a field, or any piece of land, will undoubtedly intercept more water than when it is carried straight up the bank or rising ground; this principle holds good in every case, whether the drain be made to receive surface or subterraneous water. Drains winding across the slope or declivity of a field, whatever their number or depth may be, their effect upon tenacious or impervious sub-strata will be much greater than if they were made straight up and down the slope; and when the soil is mixed with thin strata of fine sand, which is the case nine times out of ten, the effect will be increased in proportion, and, accordingly, a much less number will answer the purpose, the expense will be greatly lessened, and the land and occupier much more benefited in every respect The great error in the many systems of draining land now brought forward, is their universal adoption of running the drains straight up and down the slope in the furrows, instead of carrying them across it, and also in the smallness of their dimensions, without paying the least attention to quality of the soil and sub-soil, and whether the wetness proceeds from surface or subterranous water. It is quite impossible for drains that are only two or three inches wide at bottom, and filled only ten

inches high with broken stones or gravel, or laid with tiles covered with the impervious clay that has been taken out of them, more especially if they are made straight up and down the declivity, can have the same effect of drying the land as when they are carried across the slope and made of larger dimensions; neither can such drains be so durable, as they are much more apt to blow, owing to their small dimensions, when made up and down the slope, than when they are made the reverse way. This assertion is founded on facts and practical knowledge; and I am convinced that nine-tenths of the land that is attempted to be drained by furrow drains, would be much more effectually and permanently drained at half the expense, if proper means were employed. I have lately had many opportunites of seeing this verified; but one, in particular, drew my attention in a field near Glasgow, which had been furrow drained in the summer of 1832. I observed, in passing it in the following spring, that many of the drains were already blown. The soil is of a sandy nature, and the ground has considerable declivity to the south; which circumstances ought to have pointed out the necessity of deep drains, and having them carried across the slope, by which means a complete drainage would have been effected, and the permanency of the drains secured at a much less expense. Among many other instances of this kind which have come under my immediate observation, is a field of nine acres belonging to Lord Strathallan, in Perthshire, which was attempted to be drained some years ago. The soil and sub-soil were a somewhat stiff tenacious clay, mixed with thin veins of fine sand. No less than three hundred and ninety-six roods of drains, averaging from two and a half, to three and a half feet deep, were run in straight lines up and down the slope, and filled promiscuously with stones, from the size of a man's hand to that of the largest ox's head. The first three or four years after they were made, the ground appeared tolerably dry, and produced a few middling crops; but, in very few years, the drains were choked and blown, and the land became much less productive than it was even in its natural state, on account of the blown drains having formed springs where the land was perfectly dry before the draining was attempted. The failure of this ill-judged and ill-executed drainage, obliged the proprietor, in the autumn of 1830, to lift the whole of the old drains, as stated by the factor in the annexed note,* and renew the

* "*Castle Strathallan, April 29th*, 1831.

"SIR,—The drains you lined off in November last are now executed, and the land appears completely dry. The expense of lifting the old drains, which were quite useless by being stopped and bursted, was as follows:—

operations, by running the drains across the declivity, whereby not only one hundred and fifty-three and a half roods of drains have been saved, but a perfect drainage of the field has been accomplished at less expense than the lifting of the original drains. Many other examples of the failures of drainages from the same cause might be adduced, but, from their similarity, I consider it unnecessary in this place, I have not, however, met with any case that has not been successful when the drains were carried across the slope and made of sufficient dimensions, and amongst numerous others with which I have been engaged. I shall only mention one, which not only realized every expectation that could have been formed of it, but also was drained at one-third of the expense it would have cost if it had been done by the system of furrow draining.

This case was at Cleland, in Lanarkshire, the property of North Dalrymple, Esq. The field is of considerable extent, having a general slope to the south, and the soil is of a tenacious nature, intermixed with veins of fine sand. The drains are made across the slope, at the distance of twenty yards from each other, averaging three feet deep, and the breadth at the bottom is twelve inches: they are filled with stones, broken to the size of course road metal to within ten inches of the surface, and the remaining space with porous soil. The outlets are made winding through the lowest places, and intersecting the cross drains. These operations were finished in the spring of 1832, and have not only given satisfaction but may be recommended as a complete specimen of shallow draining.

It is evident, from the above statements, that the practice of putting a drain in every furrow, without discrimination as to the circum-

	£.	s.	d.
For lifting 396 Roods of old Drains, at 9d. per Rood..............	14	17	0
For filling in the earth at 1d. per Rood..........................	1	13	0
	£16	10	0
The expense of the new drains which you lined out were...........			
For cutting 44 roods, five feet deep and coupled, at 1s. 3½d. per rood.	2	16	10
For cutting 150 roods, four feet deep, at 1s. 0½d. per rood..........	7	16	7
For cutting 48 roods, four feet deep and built, at 1s. 1d. per rood....	2	14	0
For cutting level for the said new Drains........................	0	6	8
	£13	14	1

The Field is all ploughed and sowed with oats.

I am, &c.

PETER THORNSON, *Factor.*"

To Mr. G. Stephens.

stances of the ground, is often a misapplication of labour and loss of capital; indeed, in many instances, where it can with propriety be used, the end would be much better attained by the proper formation of ridges and furrows, combined with deep ploughing, so that no water can remain dead. I have often seen large tracts of clayey land intermixed with whitish travelled stones, lying in sub-soils perfectly impervious, effectually drained by means of trench ploughing, and keeping the furrows regularly deep from one end of the ridge to the other. If farmers occupying clayey soils would pay more attention to the formation of the ridges and furrows, and to keeping the open ditches and water *gaas*, or cross furrows, sufficiently deep, to clear the surface of all stagnant water in the hollow parts of the fields, there would be much less necessity for making drains for removing surface water. After the cause of the wetness has been discovered, and the most convenient place for discharging the water ascertained, the lines of the drains must be fixed, according to the principles already laid down, by means of pins, small pits or plough furrows. If the work is to be done immediately, pins or small pits will be sufficient marks to direct the workmen; but, in case of its being delayed any length of time, a furrow should be drawn with the plough in the line of each drain, which will shew itself two or three years; indeed, to prevent mistakes, from the marks being removed or trampled down by cattle, plough furrows are preferable to all other marks.

Open Drains.—In draining bogs or moss where the drains do not reach the hard bottom, ditches are preferable to covered drains, for should stones be used when the bottom is very soft, they would sink, whereby the drains would become useless: indeed, in all situations where the ground will allow it, the principal drains should be open; and when they can become the devision of fields, which, in many instances, is practicable, that should never be neglected. It would be unnecessary to give any particular directions for their depth or wideness, as that must depend on the quantity of water they are to convey, and on the nature of the soil and situation in which they are made: one rule, however, may be general, that the width at the bottom should be one third of that at the top, which gives a sufficient slope to the sides, and the fall or declivity should be such as the water may run off without stagnation. In very soft soils, a greater degree of slope on the sides may be necessary; and in all cases where it is meant to receive surface water only, none of the earth thrown out should remain upon the sides, but should be removed to the nearest hollows; for when this is not done, their use is in a great measure counteracted. The earth, when left on the sides, pre-

vents the surface water from getting into the drain—its weight causes the sides to fall in—makes it more difficult to scour or clean it—and adds much to its disagreeable appearance in the middle of a field. In cases where the augur or wells are obliged to be resorted to in open drains, they should never be made in the bottom, but on one side, with the outlet eight or ten inches above, which will prevent surface or flood water depositing any sand or sediment in the bore-holes whereby they might be injured.

Shoulder Drains.—Any surface water or partial springs in moss and marshy grounds, on which the large drains have no effect, and where stones cannot be used on account of the softness of the soil, is most effectually remove d by means of shoulder drains. The method of making them, is by digging a trench from fourteen to sixteen inches wide, the sides perpendicular to the depth of two or three feet, and then by taking out the last spit with a spade, the breadth of which is three inches at the bottom, and four or five at the upper part. A shoulder is left on each side, on which the sod that was first taken up is carefully laid with the grass side downwards, or if it is not strong enough, others must be cut in the vicinity, and the remaining space filled with the loose earth a few inches above the level of the surface of the adjacent ground. Drains of this description, when properly executed and moles kept out of them, will operate for a great number of years.

Covered Drains.—In every instance where covered drains are used, their dimensions depend on the depth, the quantity of water they have to carry, and the kind of materials they are filled with. When the depth does not exceed five feet, two feet wide at top will be sufficient, but whenever it is more, the width should be increased four inches for every foot in depth, and the width at the bottom should be twenty inches which will give a sufficient space to build a substantial conduit. When this is not attended to, and the bottom of the drain is made so narrow that the stones of which the sides of the conduit are formed are obliged to be set on their edges, and the covers laid on them in this insecure state, they, in many instances, fall down before the drain is half finished, causing it to burst in a very few years, and often forming springs in the driest part of the field.

In digging drains, there are several circumstances which, if attended to, will greatly facilitate the execution of the operations, such as having the stones laid down by the upper side of the lines of the drains before the work is commenced, to be ready in case the sides should slip or fall in, which often happen in mixed soils, as, when this precaution is not attended to, the expense is not only consider-

ably increased, but the work is done in a less accurate manner. Particular care must also be taken that the bottom of the drains are made with a regular descent, so that the water runs from the one end to the other without standing dead; and where bore-holes or wells are necessary, they must be made before the conduit is laid, in order that the sand may be removed which the water may throw up from the stratum below, and would otherwise be deposited in the bottom of the drain which would thereby be rendered useless. The dimensions of the conduit depends upon the quantity of water it has to carry; thus, in an outlet drain, it requires to be larger than in a cross drain, which has only the water collected in itself to discharge. In general cases, therefore, the conduit in an outlet should be made from nine to twelve inches square, and, in cross drains, from four to six inches square. When the bottom of the drain is very soft, it must be laid with flag stones, to prevent the materials from sinking; and the stones forming the side walls of the conduit must all be laid on their flat beds, and covered with strong covers well joined together and packed at their ends; the space above, in clayey soils, must be filled with stones, broken to the size of a man's clenched hand, to within twelve inches of the surface of the ground, which remaining space must be filled with porous earth. Before the earth is put into the drains, the stones must be covered with straw, rushes, or turf with the green side downwards, to prevent the loose particles from subsiding into the crevices among the stones. In cases where all the water comes from bore-holes, or rises in the bottom of the drain, eighteen inches of small stones above the covers is sufficient; but when it comes from the sides of the drain, it is necessary to fill the drain above the covers with some kind of porous substances, six inches higher than where the water breaks out; the neglect of this precaution is the reason why so many drains have so little effect in drying land.

In making covered drains, particular attention must be paid that they are not carried into the outlet at right angles, as their ends should be turned down in the direction, the water is to run a short space before they join it, to prevent the water in the outlet depositing any sand or sludge in their mouths, which will be the case if this is not attended to; indeed it often happens, on almost every estate that the drains are stopped and rendered useless from this precaution being neglected. The mouths of the drains ought also to be well built and secured with iron gratings, to prevent vermin from getting into them; and it must be examined from time to time, to see that it is in proper repair and the outlet kept a sufficient depth, so that

the water coming from the drains may run away freely, otherwise it will remain stagnant in them to the great injury of the land. To obviate this, it is advisable that a person should be appointed on every estate, under the superintendence of the factor or land-steward, to go through every field that has been drained, at least once a-year, to examine the mouths and outlets of all the drains, and make any necessary repairs as he proceeds. Such an arrangement, I am convinced, would be very beneficial, and is highly necessary, as I have often found drains completely stopped in a year or two after they were made, and the land beginning to be wet again from this cause alone. Managers of landed property ought to be very particular in this department of rural economy; indeed a clause ought to be inserted in every lease, binding both proprietor and tenant to keep the mouths and outlets of drains in proper order at their mutual expense.

Rumbling Drains.—These, are well adapted for removing water from alternate beds of clay and sand ridges, and also water confined in porous soils with an impervious bottom, as well as for receiving surface water from clayey soils. Their depth, in the two former cases is generally about four feet, and in the latter from two to three feet, and twelve inches wide at the bottom; they are filled with stones, broken to the size of coarse road metal, to within ten or twelve inches of the surface of the ground, and, in clayey soils, the remaining space with porous earth. Wood is sometimes used in drains of this description instead of stones; but, as it is liable to decay soon, and the drains will consequently be destroyed, it cannot be recommended when stones, gravel, smithy danders, or even course sand can be procured. Indeed, whenever my opinion has been asked with regard to making drains with wood, my uniform answer has been against such a practice, having had experience of so many instances in which wood had been employed, although stones might have been procured in the same field, of the land having to be drained again within a few years; and, consequently, I could not consider myself acting candidly towards my employers in advising it. An instance of this occured at Wallhouse, Linlithgowshire, a few years ago, in which I was called on to make a plan to drain the ground immediately around the mansion-house, and having examined it, I have found that the whole had been drained some years before, and the drains filled with thorns and other brushwood, which had decayed, and the clay having fallen in, springs were formed in many places in the lines of all the drains. What surprised me was to find them laid off in such a manner that there was no occasion to allow any of the old lines; and having in-

quired who was the engineer, I was answered your late brother. Being, however, aware that he never recommended drains to be filled with wood, if stones could possibly be procured, and more especially that he would not have done so in draining pleasure ground, where, in most cases, no expense is spared to do the work in the most substantial manner .I suspected that the work had not been executed according to his plan, and, upon making further inquiry, I found that my suspicions were correct, his specification having directed them not only to be made with stones, but also to have been from two to three feet deeper, which was exactly what I caused to be done, whereby a complete drainage was obtained.

Tile Drains.—These are best calculated for removing surface water, and are made just wide enough to let the tiles be put easily into them; they are, in most cases, about twenty inches deep, but tiles may be used at any depth, provided the drain is filled with broken stones, or other open materials, to nearly the surface of the ground. The tiles should always be well burnt, and laid on soles, as whenever this is neglected, which is too often the case where tile draining is now practised, their duration will unquestionably be very short, whereas hard burnt tiles will last for almost any length of time without mouldering down. The expediency of using tiles instead of stones depends entirely on circumstances; for, if stones are to be found, whether by collecting on the surface or quarrying within the lands that are to be improved, or even if they can be procured within a mile of the operations, tiles should never be used. Stones are preferable to tiles in making drains in all kinds of soils, provided a sufficient quantity are used, but where only a few inches of broken stones are used in a drain, well burnt tiles laid on thick soles, and covered with turf of any other porous substance, would answer the purpose better; and in porous soils, when the water is found at or near the bottom of the drain, if six or eight inches of broken stones were used in packing and covering them, a more substantial drain would be formed. In clayey or mixed soils, where the water enters the drain at different depths, stones, gravel, or smithy-danders, are the only materials that can be used with advantage; in any case, however, where the tiles are used, the space above them must be filled to the surface of the ground with some porous material, otherwise the drains will be useless, and the undertaking will prove a complete failure.

In the preceding pages, I have endeavoured to set before the reader, in as plain a manner as the nature of the subject would allow, a short practical detail of the principles required to be applied in draining

the different descriptions of land, in all its diversified variety of soils, strata, and inequalities of surface, and I hope it will, in some measure, convince landed proprietors and those engaged in agriculture of the folly of supposing that any single rule can be applicable to every case without being modified to the particular circumstances to which it is to be applied.

To drain land effectually, and at the least expense, must surely be the desired object of those who engage in it; but how can they ever expect to attain this, if the work is executed without any consideration of the cause from which the wetness proceeds, as is too often the practice in this country. Thus, when a field is injured by wetness, no matter from whence it comes, all that is thought necessary to dry it, is to make drains straight to the wettest place, and through the hollowest part of it, and if these have not the desired effect, others are added, and the work people are bound to make them a fixed depth, and, after cutting and carving in all directions, the land is partially dried, and, in some instances, completely, but at three times the expense it would have been if they had been properly directed. The person engaged in this arduous undertaking believes himself a complete drainer, and tells his master that there is no occasion for employing a professional man to lay off the drains, for he can do it as well as any man, and at half the expense; the master believes him and being glad he has such a clever person in his employment, gives him orders to commence operations, which are carried on for two or three years, when, after having spent a considerable sum of money to little or no purpose, a professional man has to be sent for to investigate the cause of the bad success and provide a remedy, which has generally to be a complete renewal of the operations upon other principles. Besides the instance at Castle Strathallan, already mentioned, of land having to be drained anew, another case occurred in which I was employed near Lanark, where the person acting as land-steward having prevailed on the proprietor to let him drain two fields with a number of small drains, the result was, after spending considerable time and capital, the land still continued very wet. When I was called upon, I found that not only much deeper drains were necessary to remove the evil, but also considerable alterations were required in their directions; which being executed, has proved completely effective in drying the land.

A similar cause occured at Dargill, in Perthshire, the property of Lord Willoughby de Eresby; the soil of the field is of a light nature, with a subsoil composed of a mixture of gravel and clay, from four to seven feet deep, under which lies the stratum, composed of

sand and gravel, which contained the water. The former tenant spent a great deal of money in attempting to drain it, but with no effect, as the drains were not deep enough to reach the cause of the wetness, on which account the field lay nearly waste for several years. His lordship being anxious to bring it into cultivation, I was desired to get it drained; and, accordingly, I found it necessary to deepen the outlet, and to have it covered, on account of its great depth: the conduit was made twelve inches wide and two feet high, which not only gave the necessary fall for the drains in this field, but also for others connected with it. It was also necessary to make three new drains in this field, instead of the numerous small drains which were made by the former tenant, one four feet, one five feet, and the other seven feet deep, which completely answered the purpose, and made it nearly as valuable as any other part of the farm. I could point out many other such instances, but I consider that those already stated are sufficient to put it beyond doubt, that if any drainage is executed without due attention to the quality of the soil and the nature and inclination of the strata, a failure will most probably be the result. Accordingly, every precaution ought to be taken before any operations are commenced in an undertaking on which the whole success of every other branch of agriculture depends; and, therefore, every circumstance of the art must be weighed and strictly observed, otherwise handed proprietors will most assuredly be led into serious mistakes. To obviate this as far as lies in my power, I have been induced to draw up this practical essay, with the view of its being the means of introducing a more perfect knowledge of the principles necessary to be applied in draining every kind of land; and which I have found, during thirty years' practice, to be uniformly successful in every case where the plans and specification were strictly attended to. This will not, however, be the case if alterations are made, as is frequently done, with the plans of professional men, and which I have sometimes experienced myself, in the drains not being made either the depth nor filled with the same quantity or quality of materials as prescribed, and even, in some instances, the lines of the drains have been altered, consequently the land has been imperfectly drained, whereby the system has come into disrepute, as not answering the soil, or on some other frivolous pretence.

Too much cannot be said in favour of draining, which, particularly when conducted on proper principles, must be beneficial to all parties concerned. Whatever, therefore, may be the defects of this essay, I hope it will call the attention of agriculturists to this system, as first practised by Elkington, and which has proved so useful, not

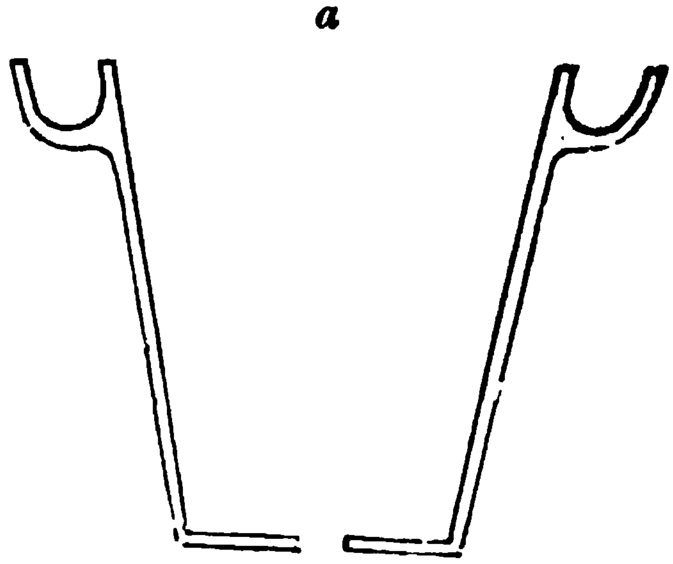
only in our own country, but also in others, as will be seen by the Archbishop of Sweden to the Royal Agricultural Society at Orebro, which will be found in another part of this work; and I trust that what I have said will shew that it ought to be vindicated and encouraged by every one who has the welfare of agriculture at heart, untill another shall be produced superior to it, which, assuredly, has not yet been done.

NATURAL HISTORY.

ARTICLE XIII.—ON THE PRESENCE OF CARBON IN LIVING PLANTS.—By J. B. Jun.

My attention was directed to the subject of the present paper by a doubt expressed by the Author of the Domestic Gardener's Manual, as to the presence of carbon having been proved to exist in the living plant, and on reviewing the researches of Sir H. Davy on this particular branch of chemistry, I could not help been struck at the manifest source of error to which his deductions were liable, in consequence of the air in the receiver having free communication with the mould in which the plant over which it was inverted, was growing, so that any decaying vegetable substance in the mould would undoubtedly impregnate the air in the receiver with the gases which are so copiously evolved during the process of vegetable decomposition; and though the analysis of the air in which the plant had been growing might afford a larger portion of carbonic acid gas than the external atmosphere, it could not with certainty be deduced that that excess was given out by the plant, nor would the conclusion that the plant had only absorbed a certain portion be more correct, seeing that the gas was liable to be supplied by the mould in which the roots grew. In order to avoid the above source of error, I had a pot made exactly like a common flower pot, with a Bygrave slug preventer fastened at the top of it, only made all in one piece; but for fear the description should not be sufficiently intelligible, I herewith send you a section of it. (Fig. *a*.) I then placed a small pot containing a geranium inside of the other, which was made sufficiently deep to allow it to sink two inches below the top. These two inches were filled up with well tempered clay, to within about half an inch, which was filled with bees' wax and resin, run over it while hot,

a



so that all communication between the mould and the surface was effectually prevented. I now filled a glass-receiver with rain water, which had been previously boiled, and inverted the pot into it, and plunging the whole under water I brought it to an upright position, the receiver standing over the plant full of water, which was prevented running out by the lower rim of the bell-glass being immersed in the trough round the pot. I then injected oxygen gas into the glass, till nearly the whole of the water was out, and with a small syringe forced a quantity of lime water under the rim of the glass, until I considered the water which remained in the trough sufficently impregnated with it. I used lime water, as affording the readiest means of detecting any carbonic acid gas that might be given out by the plant. I then placed the pot in a window, not exposed to the sun, and as this was done in the morning, I had an opportunity of observing if any carbonic acid were given off during the day; but in the evening I was unable to discover any sign of its having been evolved. The next morning I found the surface of the lime water covered with a thin film, which could only have arisen from the lime which was held in solution having imbibed carbonic acid. Now as all communication with the external air, and also with the mould in the pot was entirely cut off, the only source from which the carbonic acid could have been derived was the plant. It will perhaps be needless to state, that the plant was perfectly healthy without a sign of decay or any of its parts, and that the oxygen used had been thoroughly washed in lime water, so as to destroy every trace of carbonic acid in it.

Gosport, April 23rd, 1834.

T. HARDCASTLE, PRINTER, CHURCH-STREET, SHEFFIELD.

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HORTICULTURE.

ARTICLE I.—AN ACCOUNT OF THE DIFFERENT VARIETIES OF CELERY.

THE common Celery, Apium Graveolens, or Smallage, is a well known hardy biennial plant, and an old inhabitant of our Gardens. It is usually found, in its wild state, by the sides of ditches and near the sea. In this state, it is very coarse and rank, consequently unfit for culinary purposes. It is not, therefore, a little surprising to notice what effect cultivation has upon this vegetable, when we almost daily see its sweet, mild, and crisp stalks sent to our tables in various shapes. The leaf stalks, when blanched and in their raw state, are sent to table, as a salad, nearly the year round; they are also frequently stewed, and put in soups; but where neither of the above can be procured, a good substitute may be found, by making use of the seeds for soups, &c. a small quantity being sufficient for the purpose. The following is an account of the different varieties with their synonyms.

1. *Common Red.*—Syn. New Red. Red.

This is of dwarfish growth, strong and erect, of a pale red colour, and much piped, The leaves are rather large, of a darkish green, and somewhat wrinkled; the serratures large, and in general very obtuse. It is not a very desirable variety for cultivation, in consequence of its being so much piped. Of middling quality, crisp, but not high-flavoured.

2. *Solid Red.*—English Syn. New red. New large red. Striped solid. French Syn. Celeri plain, Celeri plain rose.

The stalks and leaves of this variety are similar to those of the preceding, but of stronger growth, and of a brighter red colour. It is very solid, crisp, and of excellent quality. This I believe to be the red variety most commonly cultivated.

3. *New Russian.*—English Syn. New large purple. French Syn. Celeri gros violet—Celeri gros violet de Tours.

This is the largest and best kind of red Celery at present in cultivation; it is of very strong and rather tall growth, the stalks are of a dark red or purple colour, deeply furrowed and remarkably solid.—Leaves much larger and of a darker green than these of the preceding varieties, much wrinkled, and of a very thick texture.—Of very superior quality, firm, crisp, and high flavoured.

4. *Common White.*—The stalks of this variety are very small, but numerous and slender; it is of dwarf and spreading growth, much piped, and in general habit throws up many offsets. Leaves pale green, small, plain and of a thin texture, the serratures small and very accuminate. Of rather inferior quality, and, therefore, scarcely deserving cultivation.

5. *Solid White.*—English Syn. Fine white solid. French Syn. Celeri Tarc.—plain blanc.

This is of strong and rather tall growth, for the most part very solid though occasionally when grown too strong it will come a little piped. Leaves palish green, much larger than those of the preceding, and somewhat wrinkled; the serratures large and rather obtuse; a good variety, and is, I believe, the white sort most generally cultivated.—Of excellent quality, firm and crisp.

6. *New White.*—French Syn. Celeri Tarc blanc gros a plein.

This variety is of very large and strong growth, the stalks are unusually broad, and the furrows very deep.—Leaves very large, of a bright green, much wrinkled, and of a thick texture; the serratures large and obtuse. Of very superior quality, firm crisp and high flavoured.—This is decidedly the best of the white kinds for salad.

7. *Giant Syn.*—Italian, North's, Upright Patagoman.

This is of very tall growth, often exceeding four feet in height, very erect, and rather strong, somewhat piped and deeply furrowed.—Leaves very large, darkish green, slightly wrinkled, and of a thin texture. Serratures generally very large and obtuse. Of good quality, but not high flavoured. It is a good variety to cultivate for soups &c, on account of its gigantic size. I have been informed that there is a variety under the above name which is perfectly solid; but I am sorry to say it has never come under my observation.

8. *Dwarf White.*—French Syn. Nain frise.

The stalks of this variety are very erect, strong, broad and very solid, rarely exceeding fifteen inches in height.—Leaves dark green, small, much wrinkled, and of a thick texture, the serratures few and very obtuse, some of the leaves are nearly entire. This is a very singular

variety, the leaves being for the most part in fours, while those of the other varieties are usually in pairs.—Good and crisp, but not high flavoured.

9. *Curled white.*—This is also a dwarf kind, of spreading growth, slender and much piped; in general habit throws up many suckers, and forms a kind of bulb at the root resembling Celeriac. Leaves lightish green, small and numerous, of a thin texture, and deeply divided into irregular segments; they are much curled, resembling curled parsley. Serratures very small, and acuminate. It is good and crisp, but not high-flavoured. This variety, I believe, is but little known, yet I think it would be a great acquisition, if cultivated solely for garnishing; it is uncommonly hardy.

10. *Celeriac.*—French Syn. Celeri rave.—English Syn. Turnip rooted Celery. German Syn. Knolle cellerie.

The roots only of this variety are used; in size they resemble a rather large round Turnip. It is extensively cultivated on many parts of the continent, and I am glad to see it becoming a favourite dish in many parts of this country, for I believe it to be a valuable addition to our kitchen gardens. It is excellent when sliced and put in soups.—It is also a great acquisition to our salads, the roots in the first place being divested of all their fibres are afterwards pared, then put in cold water on the fire, not in water previously boiled; they are then boiled till a fork will pass readily through them. When cold, they are eaten with oil and vinegar. They are also occasionally stewed in rich sauces, and make an excellent dish.

ARTICLE II.—PREPARATION OF FRUIT-TREE BORDERS.

BY MR. WM. DENYER,

Gardener to Lady Webster, Battle-Abbey, Sussex.

When wall trees are in a declining state from old age or other causes, and fail to bring forth their yearly productions, it is time they were removed and young ones put in their places. It sometimes may be seen that three parts of the trees trained against a wall are of very little use. When this is the case, it is better to remove the border throughout, then to partially do it. If there are any worth saving, they may be taken up and replanted; this may be done as the renewing of the border is carried on, but they should be prepared for this, the spring previous to taking them up. This may be done by digging trenches around them, in form of a half circle, about two feet wide, and deep enough to get below the roots, and about two or

three feet from the stem, according to the size of the tree, and filling them up with light rich soil. In renewing the old border, take out a trench at one end and carry it to the other, which will be ready to fill the last with. If the old border never had any stones, &c. put at the bottom, it should be done by laying some at the bottom of every trench; a drain may be made also by digging a little lower in front. The quantity of dung, loam, &c. for renewing, must depend entirely on the state of the old border, if it is much exhausted it will want a good portion of well rotted dung, with some fresh loam and road scrapings; if it is not much exhausted it will want the greatest portion of loam with a little dung and road scrapings. Some Gardeners make fruit tree borders very rich, which often prove very hurtful to the trees, by causing them to make a great deal of strong wood and produce but little fruit; if there is any bad soil in the old border such as clay, gravel, &c. it must be taken away.

I do not think it necessary to make the border so deep for every sort of fruit trees, as I stated above for making new borders, that depth is the most suitable for Peaches, Nectarines, and Apricots. Pears and Cherries do well in about twenty inches of soil on a bed of stones and gravel. Plums and Apples want two feet. Grape Vines two feet and a half, on a bed of stones eight or ten inches deep. Figs want eighteen inches.

In making new borders, or renewing the old, some difference should be made in the soil for different kinds of trees, if it can be conveniently done. I subjoin a list of a few kinds of fruit trees, with the sort of soil which each kind will do well in.

For Peaches, Nectarines, Apricots, Plums, and Grape Vines, half of good top-spit loam; a little more then one fourth of well rotted dung, and another fourth part of road scrapings and vegetable mould, the whole mixture must be well incorporated.

For Pears and Apples, three-fourths of loam, one fourth of road scrapings and vegetable mould well mixed. For Cherries a fresh hazel loam with a little well rotted dung.

For Figs, a rich pliable loam.

I hope I shall not intrude too far on your pages, but I must add that stones are of great importance at the bottom of fruit trees. They take off the superfluous moisture in wet weather, and retain moisture in times of drought. The fruit is also much better flavoured when the tree grows on a dry bottom.

June 10th, 1834.

ARTICLE III.

MONTHLY HORTICULTURAL CALENDAR, FOR AUGUST.

FRUIT DEPARTMENT.

Apple Trees.—About the beginning of the month, a small buff-coloured moth deposits its eggs on the under side of the leaves, where in a few days they will be hatched. They feed in droves, and forming themselves a kind of web, they remain feeding till September or October, and then go into the pupa state, in which they remain till the following spring. There is another also which deposits its eggs at the same time, and also feeds in a thick web. They both are evidently the same species that feed on the sallow, &c. &c. the webs of which hang in such abundance upon our hedges throughout the summer. The last moth is white, covered with many distinct black spots. There is also another with wings of a chocolate colour, marbled with white, which deposits its eggs about the middle of the month. The caterpillars may be gathered by the hand, and the trees syringed with soap suds any time in the course of the month.

Cherry Trees.—If caterpillers begin to infest the trees this month, pick off the infested leaves, and towards the end of the month, wash the trees well with warm suds. If the black fly appears, mix some tobacco water with soap and water.

Bud Peach and Nectarine Trees, as also several other sorts of fruit Trees, early in the month.

Currant Trees should now be matted in dry weather, to preserve them till late in the season:

Fig Trees out of doors will begin to ripen their fruit; give them abundance of water at the roots, if the weather be dry. Soap-suds are the best.

Gooseberry Trees may possibly be infested about the beginning of the month with a second brood of caterpillers; keep them down with the hand until the fruit is all gathered; then boil some foxglove plants in an old copper, or any vessel not used for other purposes, and water the trees over head with the liquor through the rose of a watering-pot. The effects will be instantaneous, and in a great measure this will prevent their appearance the following year. Be careful not to water the ripe fruit with it, for it may have an injurious effect upon the individuals who eat it.

Peach and Nectarine Trees, if infested with the Aphis and red Spider, may be treated as follows:—To three bushels of quick lime

and three bushels of soot, add twenty gallons of soft water; stir it up, and take off the scum for several days; then take the clear liquor, and add one quart of good tobacco water to every two gallons, and apply it with a syringe or engine. For the red Spider, add, about a quarter of a pound of sulphur to the above quantity.

Pear Trees may be occasionally watered with clear lime water, to destroy the little insect which feeds upon the upper rind and pulp of the leaves.

Plum Trees if infested with the Aphis, as soon as the fruit is gathered, pick off the worst of the leaves on which they are feeding, wash the trees well with soap-suds and strong tobacco-water, which, in general, will be found effectual at the first dressing.

Strawberry Beds, in late situations, and now in bearing, will require watering, if the weather proves dry. Those in pots intended for forcing must be constantly divested of their runners. This is also a good time to plant new beds.

Vines in Pots now brought into the Vinery will ripen their fruit in January.

VEGETABLE DEPARTMENT.

Carrots sown about the middle of the month will be fit for table in the spring. A small fly deposits its eggs on the carrot, about the beginning of the month, but we are unable either to tell what sort it is or how to destroy it properly and effectually.

Cabbage Seed sown the first week will come in for coleworts in winter and spring. Also finish planting Savoys, &c.

Cauliflowers planted out now will be in use from October. Towards the end of the month, sow more seed to stand the winter in frames.

Celery planted out last month, will require earthing in fine weather; and more should be planted for spring use.

Cucumbers raised from cuttings, if well watered and otherwise looked after, will bear abundantly from the beginning of September.

Endive.—Plant out for a full crop, and sow more seeds to come into use early in the spring.

Lettuces sown in the first and third weeks, come into use in October; plant out also from the seedling beds such plants as are of a sufficient size.

Onions must be taken up in fine weather. Sow a few Stratsburgh to use in October and November; and about the middle of the month, sow a crop of Welsh for winter use.

Mushroom Beds made now, come into use in October.

Broccoli.—Sow Green Cape, and Early Purple Cape, to produce heads in April and May next year.

Shallots and Garlic must be taken up, if not already removed. Choose dry weather for the purpose, and spread them out until sufficiently dry to tie up in bunches.

Sweet and Bitter Herbs are readily propagated by slips or cuttings. And on fine days they should be gathered, to dry for winter use; let this be done just before they come into flower.

Spinach.—The prickly and Flanders should be sown for a full winter crop, not later than the middle of the month.

Turnips should be sown in the first week for a main crop at the end of autumn, and about twice more to succeed them.

ARTICLE IV.

CONSTRUCTION OF THE PINERY, AT WOBURN ABBEY,

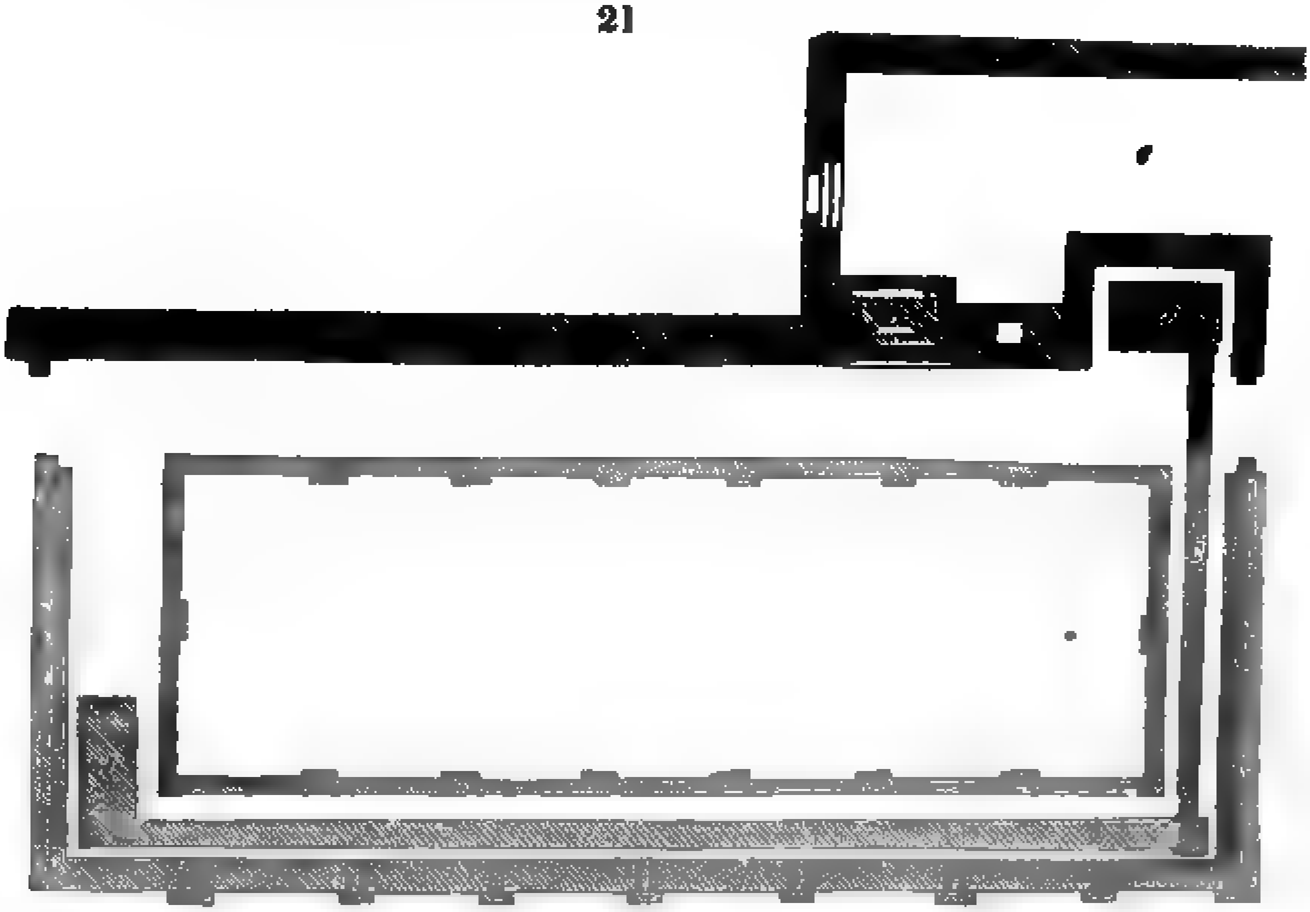
As Figured and Described in the Hortus Woburnensis.

BY MR. FORBES.

THE annexed Ground Plan, (Fig. 21,) and Section (22), will illustrate the principle upon which the Pine-House at Woburn Abbey is erected. It is executed from the designs of W. Atkinson, Esq. This house is 65 feet long, and 13 feet wide, in the clear; and is divided into two divisions (one of which only we have figured.) The sashes and rafters are wood, and fixtures; consequently air is admitted by the ventilators (*d, d.,*) that are placed in the top of the back wall, and along the centre of the front wall, which together with opening the doors, will admit a sufficiency of air in the summer season, for the Pine Apple. The house is heated by hot water, with separate boilers and pipes to each division; there is one boiler for each division, which is placed in a recess about the centre of the back wall, *(a)* the dimensions of which are two feet six inches long, one foot six inches wide, and one foot eight inches deep, of an oblong square. There are two pipes (*b. b.* see Section,) attached to each boiler, one near the top, and the other at the bottom; the upper pipe is round, until it reaches the front of the house, when it forms a square of 12 inches broad by four inches in diameter; the lower pipe is circular, and four inches in diameter. These pipes convey the water from the boilers across the ends, and along the front of the house to the reservoir belonging each division as (*d.,* see Ground Plan,) which is of the same dimensions as the boiler, and is filled with water, flowing from the boiler; as the pipes, reservoir and boiler, are placed all on the same level, and filled about equally, within half an inch of the top, so as to allow room for circulating the heat regu-

larly from one end to the other. When the fire is lighted under the boiler, the water, as soon as it begins to get hot, immediately ascends to the top of the boiler, and flows along the upper pipe, to the reservoir, when it forces the cold before it in the under pipe, back into the bottom of the boiler. The circulation of water is continued from one extremity of the house to the other; the hottest passing rapidly along the upper pipe, and the coldest returning through the lower one, back into the boiler, which will soon heat the pipes so as to raise the atmosphere of the house, in the severest weather, from 75 to 80 degrees, and that when we have had 28 degrees of frost. Each of these houses, or compartments, are capable of containing 70 fruiting

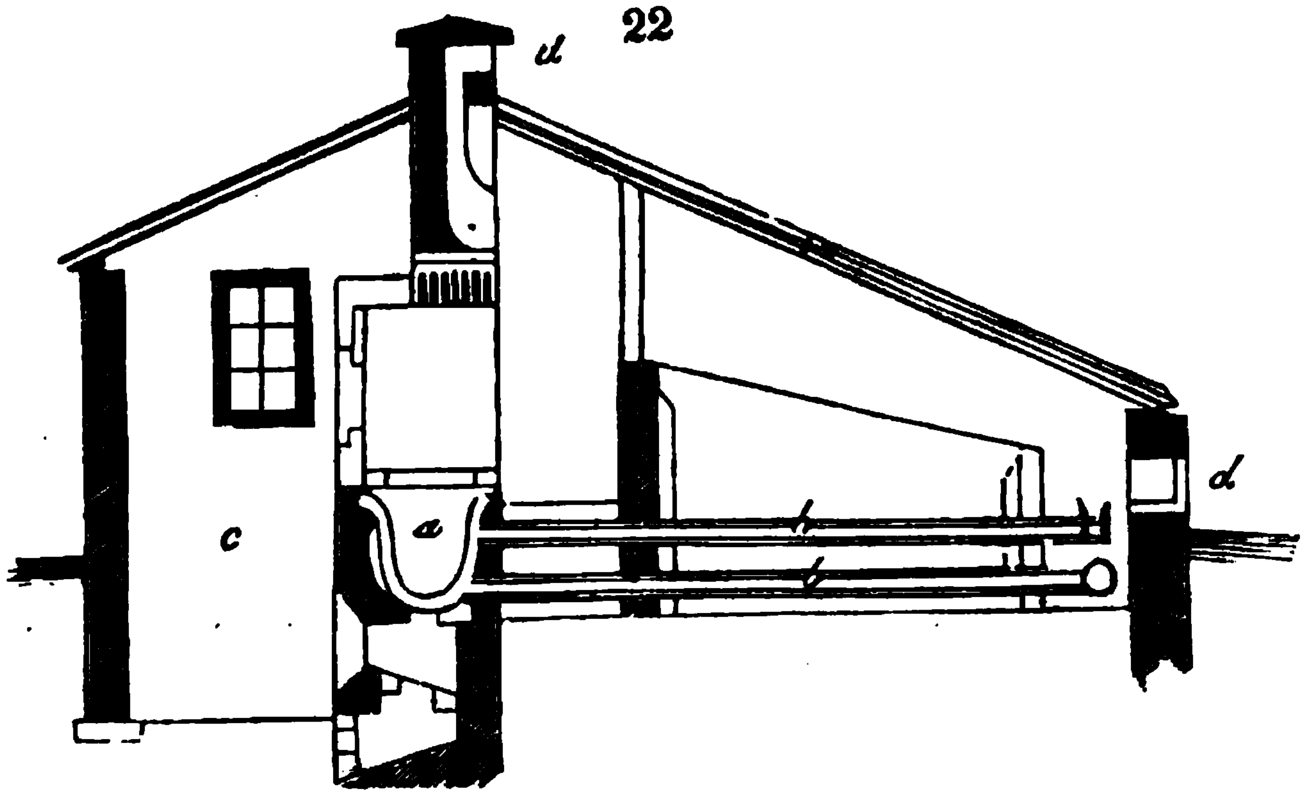
21



Pine plants; the atmosphere of the house may be kept regularly from 60 to 65 degrees, in the severest weather, without consuming more than three-fourths of a bushel of coals to each division; or a bushel and a half to the two compartments. The fermenting leaves in the pits also assist in keeping up this temperature. The pipes, boiler, and reservoir in each, contain about 140 gallons of water; when the fires are first lighted to the Pinery, the furnaces, &c. being then cold and damp, it takes about an hour to heat the water to 130 degrees; but when it is once heated, after the first night, it may be raised to the same temperature in 20 minutes; as from the volume contained in the apparatus, it will retain its heat for nearly 24 hours, con-

sequently the water is about milk-warm when the fire is lighted in the afternoons. In the winter of 1829, which was the severest season in this part of the country within my remembrance, the self-registering thermometer indicated 28 degrees of frost, two different nights that season; which afforded ample means of ascertaining the power of the hot-water; and as both divisions of the Pinery were then at work, the fires were made up both nights, at five o'clock in the evening; one of the compartments was regulated at eight o'clock, at 70 degrees, and the other at 60 degrees; the dampers were then shut close, so as to confine the heat around the boilers, and prevent it from escaping out of the chimney, but no fresh fuel was added after five in

22



the evening; the next morning, at eight o'clock, the division that was left at 70 degrees; the previous night, had lost 10 degrees; and the other, that was regulated at 60 deg., only 5 deg. during the night. This lapse of 15 hours, without any fresh fuel being added, and that when we had twenty-eight degrees of frost is a sufficient proof that the hot-water has adequate power to answer all horticultural purposes in the most inclement season, when the apparatus is properly constructed, and is of a sufficient magnitude for giving out caloric, according to the size or area of the house, which it is intended to heat. The furnace is attended from the shed behind (*e*), in which is also placed a cistern (*b*), for supplying the houses with water.

ARTICLE V.—DESIGN FOR A FRUIT-ROOM.

BY MR. J. WALDRON,

Gardener at Elm-Grove, Roehampton, Surrey.

AMONGST the observations regularly appearing in the various periodicals, I find very little notice taken of the construction of Fruit Rooms. It usually happens that they are situated in some back

shed, or other place equally as badly calculated for the preservation of the fruit, and there appears in general to be very little store set by them, as though they were buildings of no importance to a gardener. However, I differ very much from this opinion, inasmuch as I think great care is requisite not merely in the gathering of fruit, but in its being suitably housed and preserved. With this view, I have drawn up my ideas of a fruit room, which I have no doubt will answer the purpose remarkably well.

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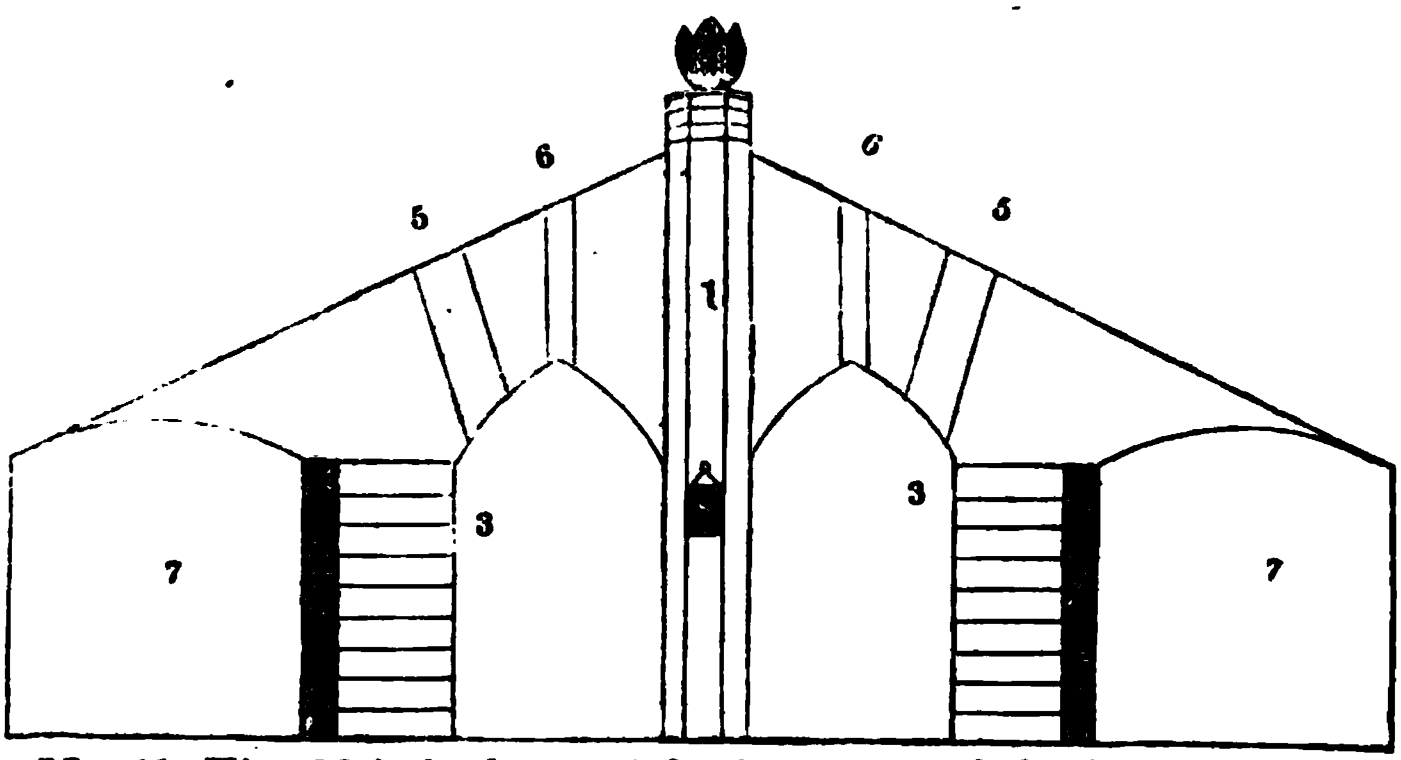
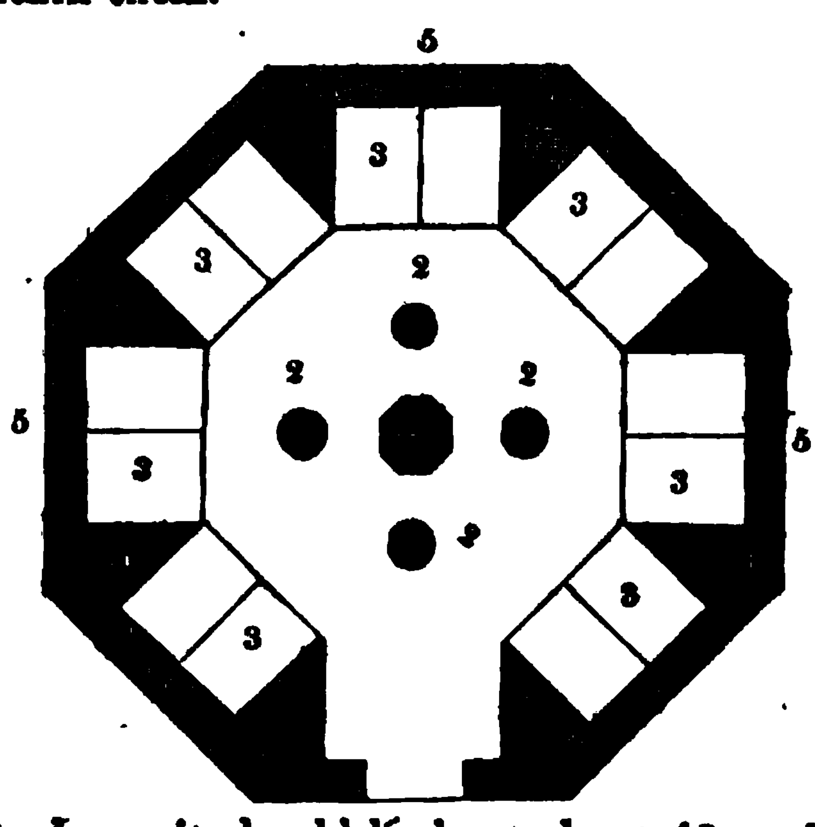


No. (1, Fig. 23,) is the upright in centre of the house (2) are ventillators to admit air (3) are the Drawers in which the fruit are laid. (4) are cavities filled up with saw-dust to prevent the entrance of air (5) three sky lights (6) ventillators in the roof to allow the escape of foul air. (7) A walk six feet wide, all round the house with creepers on the front. (8) A slate with the numbers of the drawers and the names of the fruit within them.



The house is 18 feet wide inside measure. The drawers are two feet six inches wide, three feet long, and nine inches deep; in each square of the house there are eighteen or in the whole house, one hundred and twenty-six. The temperature of the house should be, from the time it is stocked with fruit until the end of February, from 40 to 45 degrees, and from February to June, it should be kept about 40, and by no means exceed 45 degrees.

In gathering the fruit, great care is requisite. The great error into which most persons run, is gathering too soon, always allow the fruit to hang on as long as possible, or otherwise it withers and becomes tasteless. Always gather them when quite dry, and be careful not to bruize them; take them at once to the fruit room, and place them in the drawers, in layers singly; cover over the first layer, with dry saw-dust, and place another layer, and so on until the business is completed. There is no difficulty, by this mode of preserving, (and in a house constructed on this principle) of keeping the choice Apples and Pears throughout May and June.

The house must in all cases be built in a dry situation, and the ventillators (2) should have free access to the atmosphere from the outside of the house. A flue should also run under the floor; and the enterance door may be half glazed. The roof may be covered with thatch. The outer walk (7) is intended to keep the walls of the house dry in winter, and cold in summer. The arches may be gothic, and the materials rustic. A table should be placed round the middle pillar (1) two feet wide.

FLORICULTURE.

ARTICLE VI.—CULTURE OF THE GENUS VIOLA.

This genus contains more than a hundred species and varieties, the greater part of which are ornamental and deserving of notice. They are chiefly hardy, and will thrive in a mixture of peat and loam; and, with a few exceptions, they are very low growing plants. The tender species are, V. arborescens, decumbens, humilis, caespitosa, pygmea, betonicaefolia, and Broussonetiana. These may all be treated as half-hardy plants; and all with the exception of arborescens, may be propagated by a division of the root. The V. arborescens, may be either increased by cuttings or layers. The best time to put in the cuttings is as early in the spring as they can be obtained, generally in March. They are easily struck, if planted in a light rich sandy soil, and covered with a hand-glass, in a shady part of the greenhouse. The V. odorata, and its varieties, are well known and appreciated in our gardens, for the delightful fragrance they emit. The great point amongst gardeners is to have these throughout the winter; for this purpose a double variety, called the Neapolitan is evidently the best. The old blue violets seldom force so well, but the other may be had in perfection all through the winter with very little trouble. The culture may be stated as follows:—

The first thing to be attended to, is to obtain as early a crop of runners for planting out as possible; the growth of these may be much forwarded by sifting a little light soil, or vegetable mould, over the old plants, as soon as they have done flowering, and by watering them with a rose watering-pot.

When sufficiently rooted, which will be about the end of May, take them off the old plants, and prick them out in a bed of light loam, or loam and peat without any manure. Make the bed in an airy, but somewhat shaded situation, and place the plants in rows six inches apart, and four inches from plant to plant in the rows. Keep them perfectly free from weeds, and water them if necessary; and by the end of July, they will be ready to plant into the flowering beds.

Make a bed for them to flower in as follows:—Take out the old soil six inches or more deep, and fill the opening with a mixture in the following proportions. One barrowful of light sandy soil and one barrowful of rotten cow-dung, to every two barrowsful of sandy peat.

When the bed has properly settled, take up the plants on the nursery beds with good balls, and plant them in rows, six inches apart every way.

They will now require no further attention than occasionally watering, and keeping them free from weeds. When the nights begin to be cold, place a frame over them, and put on the lights at night; and in very rough weather preserve them from the effects of frost by covering with mats, and they will be in flower in December, and will continue flowering till February.

In some cases it may be wished to grow them in pots, for the windows, during winter; for this purpose pot them in August, and, if convenient, set them in a hot-bed frame as they are wanted to come in flower; but if this cannot be done, they will flower very well placed in the window of a warm room.

The Viola tricolor has now become a flower of much repute amongst florists, many of the varieties having remarkably large flowers of very brilliant colours. It is called Hearts Ease, Pansy, and various other names, and is well known amongst our lady gardeners. Their mode of culture is as follows. Always sow the seed within a month after being gathered, except it be gathered after September; in which case it must not be sown till the following April, unless in pots or boxes.

Make the bed, on which to sow the seed, of light sandy soil, in a shady situation; lay just as much finely sifted soil on the seed as will cover it; then gently pat it down with the back of a spade, to cause the soil and seed to adhere to each other a little.

In ten days or a fortnight the plants will be up; when an inch high, transplant them into beds, placing them in rows four inches apart every way.

As this is the bed on which they are intended to flower, always select a somewhat moist situation, but yet well drained; and if not naturally so, drain it for the purpose. And the plants will flower the following spring.

All valuable sorts may be propagated by cuttings. These, to be successful, should not be put in later than the beginning of June; for if left later, their flower stems become hollow and pithy.

Plant the cuttings either in thimble pots filled with light sandy soil and well rotted dung, or on a shady border under a hand-glass. If they are planted in pots, set them in a cold frame, and give them a little shade until they have struck root.

Layers.—In May or June make a slight incision in the joint as for other layers, and peg them down about an inch or less in the soil.

Division.—They may be divided almost any time throughout the summer, but it is requisite that this be always done in moist and dull weather.

Never make the beds on which they are to be planted higher than the surrounding surface, which would render the soil too dry for their successful growth.

To ensure a fine show of flowers, it is necessary to renew the plants every year. Old plants invariably produce smaller flowers.

Properties of a good Heart's Ease.—The flower stem must be of a sufficient height and strength to raise the flower above the foliage of the plant; the petals of the flower large, flat, and without a notch or fringe on the edge. The colours must be clear, brilliant, and permanent. The eye should be small compared with the size of the flower.

ARTICLE VII.—CULTURE OF THE GENUS BANKSIA.

The soil most suitable for them is equal parts of peat and light loam, with a small portion of sand. Mix these ingredients well together, and break them fine, but do not sift them.

In potting, always be careful to give a good drainage; filling not less than one-fourth of the pots with broken potsherds, and on the top of these lay a little rough turfy soil, to prevent the upper soil from falling amongst them, and stopping the passage of the water.

Never allow them to suffer for want of water, for their roots by this means will become so seriously injured, that they scarcely ever

thoroughly recover, if this is the case. They also suffer greatly, if too much water be administered, but when the drainage is good, the injury is seldom so serious as from drought.

During the time they stand in the green-house, do not allow them to be crowded by other plants, neither suffer them to be much shaded; but in summer, when they are placed out of doors, allow them to stand in a shady situation, where they can only receive the morning and evening sun.

Whilst out of doors, be careful that no worms effect an entrance into the pots; to prevent this, always place a board or slate for each pot to stand upon, but should any find their way in, once or twice watering with clear lime-water will destroy them.

If the weather is very wet, they must be set in a pit, or frame, or airy greenhouse during the summer months, or the wet would very likely destroy them.

Propagation by Seeds.—Sow them in pots filled with the same kind of soil in which the plants are potted.

The best time to sow the seed is April; cover them a quarter of an inch deep, give them a gentle watering, and place them in the greenhouse. If they are not up by the end of May, place the pots close under a south wall, and cover them with a little moss to keep the soil moist, and occasionally water them, and if the seed be not very old, they will soon make their appearance. But in some cases they do not appear till autumn, therefore it is well not to be in a hurry to empty the pots in which the seed is sown.

As soon after they are up as they can be transplanted, put them into small pots, one in each, for if allowed to grow too much in size, removing is apt to kill them.

After potting, place them in a shady part of the greenhouse, until they have begun to grow, when they may be treated like other plants.

Propagation by Cuttings.—No stated time can be given for putting in the cuttings. To have success, ripened wood must be made use of. Take off the cuttings at a joint, two or three inches long, take off the leaf from the bottom joint, when it is to be inserted in the pot, but let the other leaves remain unmutilated.

When the cuttings are prepared, plant them very shallow in pots of sand; place the pots on a board or something of the kind, and place a hand-glass over them. Never either set them on a moist bottom, or plunge them, or they will most likely damp off.

As soon as they are rooted, pot them off in small sixty-sized pots, filled with the same soil the old plants are potted in.

When potted, place them again under a hand-glass or two, or in a cold frame, but they must stand on a dry bottom, or they will soon perish. When they have begun to grow, expose them by degrees, until they will bear to be treated like old plants.

ARTICLE VIII.

OPERATIONS IN THE FLOWER-GARDEN, FOR AUGUST.

Azaleas may yet be propagated by cuttings of the young wood, taken off close to the plants, and planted in sand under a hand-glass, in a shady situation.

Camellias wanted to flower early may be brought into the greenhouse, the remainder may stand out of doors till the end of September, or beginning of October.

Carnations may be layed or raised from cuttings, taken off at the third joint, and planted under a hand-glass. Transplant seedlings six inches apart, in light rich earth.

Calceolarias intended to flower late in the autumn should now have the branches cut down to within an inch of the soil and be top-dressed. Cuttings may still be put in with success.

Chimonanthus fragrans may be increased by layers; cuttings of the young wood will also grow, if planted in sand under a bell-glass, and the pot be plunged in a little heat.

Cyclamen persicum should be turned out of the pots in which they flowered, and planted in an open but sheltered border.

Dahlia cuttings may yet be put in with success.

Greenhouse Plants of most sorts may still be propagated by cuttings.

Mignonette, to stand the winter in pots, should be sown about the middle of the month, in light, sandy, maiden soil, perfectly free from dung.

Orange and Lemon Stocks may be budded, if this were not the case last month. Cuttings may also be put in.

Pinks may yet be propagated by pipings, planted under a hand-glass, if a sufficient quantity be not put in.

Ranunculuses should be taken up, if this operation were not performed last month, and spread in a dry, airy situation, previously to their being laid by. Those planted last month will flower about the middle of September. Also plant some in pots to flower in mid-winter, in the Greenhouse.

Rose Trees of most sorts may still be budded, but the varieties of China do the best, if budded early in the season.

Violets may still be propagated by dividing the roots and cuttings.

Rockets, when out of flower, cut down the stems nearly to the ground, to induce shoots to grow for cuttings.

Tigridia pavonia.—Seedlings, which were transplanted on a hot-bed, and fully exposed to the air last month, when the leaves begin to decay, take up the roots, and lay them in an airy situation to dry in the same manner as tulips. After they are dry, put them in paper bags, and lay them out of the reach of frost, during winter.

ARTICLE IX.—NEW AND RARE PLANTS,

FIGURED IN THE PERIODICALS FOR JULY.

CLASS I.—PLANTS HAVING TWO COTYLEDONS.

LEGUMINOSÆ.

LUPINUS DENSIFLORUS.—Dense-flowered Lupins. An hardy annual, growing about six or seven inches high; it is not one of the most beautiful, the flowers grow in distinct whorls, are white, delicately stained with pink. It was raised in the garden of the Horticultural Society from seeds sent from California, by Mr. Douglas.—*Botanical Register.*

UMBELLIFERÆ

TRACHYMENE LANCEOLATA.—Lance-leaved Trachymene.—From the coriaceous leaves, frutescent stems, and crowded white flowers of this plant, it might almost be taken for a diosma. It is a hardy greenhouse plant, and was first introduced to our culture in the King's Gardens, from a solitary individual springing up in a box of Orchideæ received from New South Wales, in 1825.—*Bot. Mag.*

RANUNCULACEÆ.

RANUNCULUS MILLEFOLIATUS, *grandiflorus.*—Large-flowered Milfoil-leaved Crowfoot. A hardy perennial, with yellow flowers. The species is found in the hilly parts of Italy, Greece, and the North of Africa; this variety was found on Mount St. Angelo, anciently Garganus in the kingdom of Naples. It requires a loamy soil, and may be increased by division or seeds.—*Sweet's Fl. Gard.*

ERICEÆ.

RHODODENDRON ARBOREUM, *album.*—White Tree Rhododendron. This beautiful plant is not new, being introduced from Nipal, in 1818. It differs only from the R. arboreum in the colour of its flowers which are of a most beautiful and delicate white. It requires the same treatment as the arboreum, being like it a hardy conservatory plant.—*Bot. Reg.*

GARRYACEÆ.

GARRYA ELLIPTICA, Elliptic-leaved Garrya.—A hardy evergreen shrub, native of Northern California, where it was discovered by Mr. Douglas. It was introduced in 1828, and a male plant flowered for the first time in October last, in the garden of the Horticultural Society. In appearance it is very similar to a Viburnum, and like that genus is readily increased by layers. It has generally been cultivated in peat, but it certainly prefers a loamy soil.—*Bot. Reg.*

ANONACEÆ.

SPHÆROSTEMA PROPINQUUM, Small-flowered Sphærostema.—A hothouse climber, found by Dr. Wallich in Nipal, on Mount Sheossore, and on hills about Sankoo. It is easily propagated by cuttings, and in its fertile state must be a handsome plant, with its long pendulous spikes of scarlet berries.—*Bot. Reg.*

CLASS II.—PLANTS WITH ONLY ONE COTYLEDON.

ORCHIDEÆ.

GEODORUM FUCATUM, Painted Geodorum.—A single plant of this new species of Geodorum, sent to the Horticultural Society from Ceylon, by Mr. Watson, in 1832, flowered in the Chiswick garden last July. It thrives in a hot, damp stove, but requires to be rested after its leaves have withered.—*Bot. Reg.*

EPIDENDRUM BICORNUTUM, Two-horned Epidendrum.—This beautiful plant was flowered by Mr. Cooper, of Wentworth Gardens, last April. To that zealous and excellent cultivator, it was sent by the Messrs. Shepherd, of Liverpool, who introduced it to the stoves of Europe. The flowers are pure white, with a few purple spots on the lip.—*Bot. Mag.*

ASPHODELEÆ.

ORNITHOGALUM BIFLORUM, Twin-flowered Star of Bethlehem.—A native of Sandy hills in the Provinces of Chancay and Cercado, in Peru, where it was discovered by Ruiz and Pavon, flowering in June and July. The plant possesses no showy beauty to recommend it, but its habit is extremely graceful, and its flowers are white, delicate, and pretty, and on these accounts it is well entitled to a place in the flower-garden.—*Don in Brit. Fl. Gard.*

TRITELEIA LAXA, Loose-flowered Triteleia.—The flowers of this plant are a deep blue or purple colour. It seeds freely, and will soon be very common. No plant can be more easy to cultivate; it will grow in common garden soil, but prefers such a mixture of peat loam and sand, as is found in a border for American plants. It appears to be perfectly hardy, and if allowed to remain undisturbed, it will propagate itself by offsets as well as by seeds.—*Bot. Register.*

ARTICLE X.

ON THE PROPAGATION OF PLANTS IN WATER.

By the Author of the Domestic Gardeners' Manual, C. M. H. S.

THIS little article is perhaps of no great utility, but it may serve to amuse, if not to instruct some, who are curious in horticultural experiments. I have before given, at some length, a detail of my early practice, of striking Melon and Cucumber cuttings, in a bottle of water, plunged in a bed of leaves or tan, the temperature of which may range from 75 to 90 degrees. I pursue this practice steadily, cutting the terminating spouts of good, vigorous plants across the third or fourth joint, from their points; but this precaution is not essential with the cucumis tribe; for I have noticed that, roots may be emitted *between joints*; and even (as is sometimes the case) when the interval between the lowest end of the cutting, and the first joint above it decays, and as it were, dissolves in the water, roots will emerge from the sound parts above those that decay; hence, every facility is afforded to a cultivator. I find that frequently in three days, some radical processes are sent forth, quite sufficient to secure the growth of the plant in soil, without a moment's loss of time, and this I account for, by the perfect *safety of the removal* from the fluid medium, without the disruption, or slightest injury of any fibre or spongelet. It may, however, be as well to cover the young plant for a day or two with a hand glass, to guard against evaporation, till it has fully established its protruding roots in the terrene medium. The foregoing observations may be considered as an appendix to the facts already recorded: it remains to notice others which have induced me to offer this article to the attention of the readers of the *Register*.

The mode of propagation by cuttings is adopted extensively by every cultivator; but I am persuaded that a good deal of time may, in many instances, be economised by having recourse to water. I would by no means abandon the old mode: the only point which I believe is not sufficiently attended to, is one that seems of essential moment. Wherever a large stock of plants of one species is not contemplated, a great deal of disappointment may be saved by placing *single* cuttings in very small pots; or if three be placed in the same pot, I would urge the gardener to thrust each into a little hole in close contact with the side of the pot,—thus:—

When the three plants are rooted, and growing, a knife passed cautiously through the ball at the angle formed by the lines 1 and 2, will secure a sufficiency of earth to protect the young plant from a very serious check, and if the pots of cuttings be placed in a shallow propagation frame, having a sliding sash light a few inches only above the tips of the cuttings, there will, generally speaking, be little need of employing bell-glasses. But a few phials with necks at least half an inch clear in the bore, and nearly filled with rain water, will not only furnish a resource for the operator, but afford him an opportunity of watching, day by day, the mode in which nature effects her radical developements. I am persuaded by the evidence of my daily experiments, and the analogy thereby traceable—that, most succulent and semi-succulent plants will, if favourably treated, protrude roots into water.

Nerium Splendens;—indeed, Oleanders in general will strike freely.

Balsamina—the balsam will strike almost directly, and procure a flowering plant of three inches in height.

Gesneria will, I believe, root to *a certainty;* though not rapidly. I have by me a single leaf of *Gloxinea Speciosa,* which I took off *with its bud,* close at the junction with the stem. I plunged the phial in a bed, and in a few days, the base of the footstalk began to swell; the little bud upon it became greener, increased, and threw out two minute leaves. A fortnight has elapsed, and, to-day I observe a round, whitish knob about one-sixth of an inch across, at the base of the stalk, and one single fibre emerging from that above it,—but still resting on the leaf, a complete plant in miniature is traceable.

Now, all this is delightful and instructive. I drop a few hints only at this time, because I cannot command leisure to proceed at length; and moreover, these hints may prove a stimulus to the wise and industrious horticulturist. Reader—I beseech you to follow the lead—pursue the inquiry, and communicate your discoveries to your brethren.—None will be more grateful than he who *believes* he now communicates something of novelty; but who, if he have been, (though unknowingly) forestalled, will be one of the first to acknowledge his tardiness.

July 4, 1834.

P. S. I could *name* several experiments, but these may present matter for a future paper; however, I think that, Dahlias may be raised in water, and that, in great probability pine apple suckers and crowns would emit roots, but require a good heat and cautious immersion.

RURAL AFFAIRS.

ARTICLE XI.—A DESIGN FOR FOUR LABOURERS' DWELLINGS UNITED,

With a few Remarks on the State of the British Peasantry.

BY THE BRICKLAYER'S LABOURER.

To contribute my humble mite in any way that may tend to the melioration of my fellow labourers, has always afforded me the greatest gratification; and although the subject of the following remarks has been often advocated before in the most masterly and able manner, so as to leave me nothing new to say, yet, I trust, that the few observations which I am now about to make, together with the accompanying designs, (Figs. 24 & 25) may now prove acceptable to your readers; and that, however insignificant the fountain whence they flow, they may mingle their tributary stream with those from richer and more abundant sources.

It is by continually impressing upon the landowners the necessity of their union and sympathy with their tenantry that we can hope for success; and the present design is humbly submitted to their notice, in the anxious hope that it will be adopted by some benevolent landlord, whose wealth has not led him to forget that his dependants have nearly the same wants—the same feelings—that they are susceptible of experiencing the same inconveniences, and indeed, are of the same species as himself.

The design comprises a union of four dwellings, for agricultural labourers. Each house has the accomodation of a porch, (Fig. 24.) [1, *a*] to shelter the entrance; which is very desirable both in large and small houses; (*b*) is the lobby in which there is a shelf (*c*) for holding water pitchers, &c., and over this there may be another wooden shelf for holding a number of necessary small articles, while underneath the first mentioned shelf may be placed the smaller sized garden implements. In the kitchen (*d*) there is a low cupboard on one side of the fire-place, the top of which is to serve as a shelf for holding plates and tea things; and indeed there may be three shelves over this for holding necessary stone ware and fancy crockery; and to have, as I have occasionally seen in the north of England, a neat curtain tastefully tucked up at the top, to be let down in cases of cleaning or dusting. The boiler for heating water for washing, &c., is shewn in the kitchen, to save the expense of an additional flue and chimney stalk. Under the stairs there is a closet (*e*) for holding a small supply of fuel from the woodhouse. The back house, or back

room, (*f*) is intended for washing and cleaning in, so that the keeping room may always be orderly and comfortable, when the husband comes home to his meals even on Saturdays and washing days; the good wife must always remember, that much of her domestic comfort will depend on this arrangement. There is a pantry (*g*) if a labourer can be said to require such a convenience; this place, however, will be found very useful for holding anything by way of store on shelves all round, as it is well aired; and the under part will serve to hold potatoes and other roots. There is a wood and coal house (*h*) and a privy (*i*). The piggery and dust-hole adjoining the latter are shewn in the plan of the garden.

In the chamber floor (Fig. 2.,) each house has a bed-room for the man and wife (*k*); and in this room there is a press beside the fireplace for holding cloths, by way of linen closet; on the top of this press may be placed the books that form the small family library, and should they be fortunate enough to possess many books, two or three shelves may be placed over this. There is a large light closet for male children (*l*) and a bed closet for the female children (*m*); both of which have windows, and may, therefore, be well aired. A trap door may be made in the ceiling of the boy's bed-room to get up to the garret, where apples, onions and other roots for winter use may be dried.

(Fig. 3.) is a plan of one of the four gardens, each of which contains one rood and eighteen poles. In this plan there is the dwelling-house (*a*) offices, (*b*); piggery and yard, (*c*); dust-hole, (*d*); border for early potatoes, (*e*); dwarf apple trees and currant bushes, (*f*, *f*); mint, thyme, savoys, sage, rhubarb, parsley, &c., &c., (*g g*); border for flowers, (*h*); compartment for the second early crop of potatoes, (*i*); spinage, turnips, cabbages, lettuces, Granges, and Cape broccoli for Summer and Autumn use, Portsmouth for Winter, and Knight's self-protecting, and Sulphur for Spring &c., (*k*); onions, carrots peas, beans, scarlet runners, and leeks for winter use (*l*), large compartment for potatoes (*m*). The Ash-leaved kidney, Fox's Seedling, and Early Manly potatoes are the best for the *first early* crop. Plant them any time from the middle of March, to the beginning of April, never before that time. Dig the dung into the soil in preference to laying on the sets after they are planted in the drills, make the soil light, by mixing a good portion of sand with it. Make the drills from north to south, two feet apart, and plant the sets 4 inches from each other in the rows. The early kidneys should always be planted whole, the others may be cut, but a sufficient body must be allowed to support the eyes during wet and drought, until they

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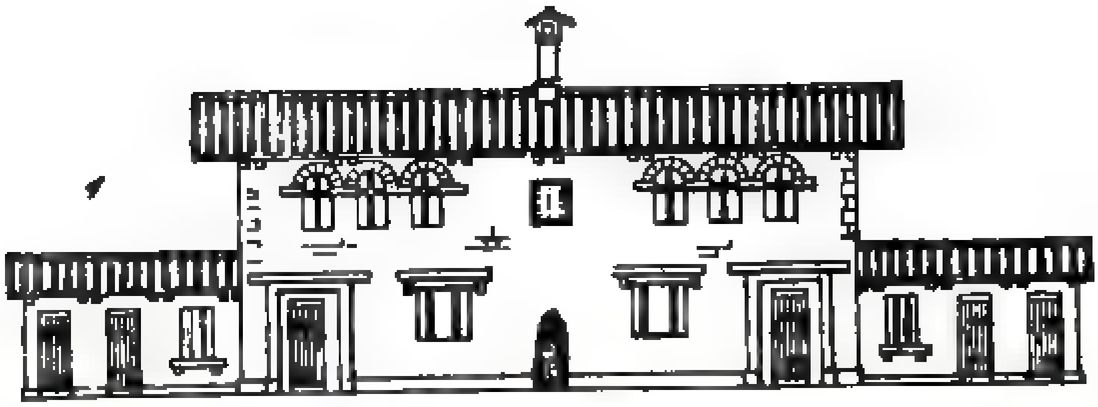

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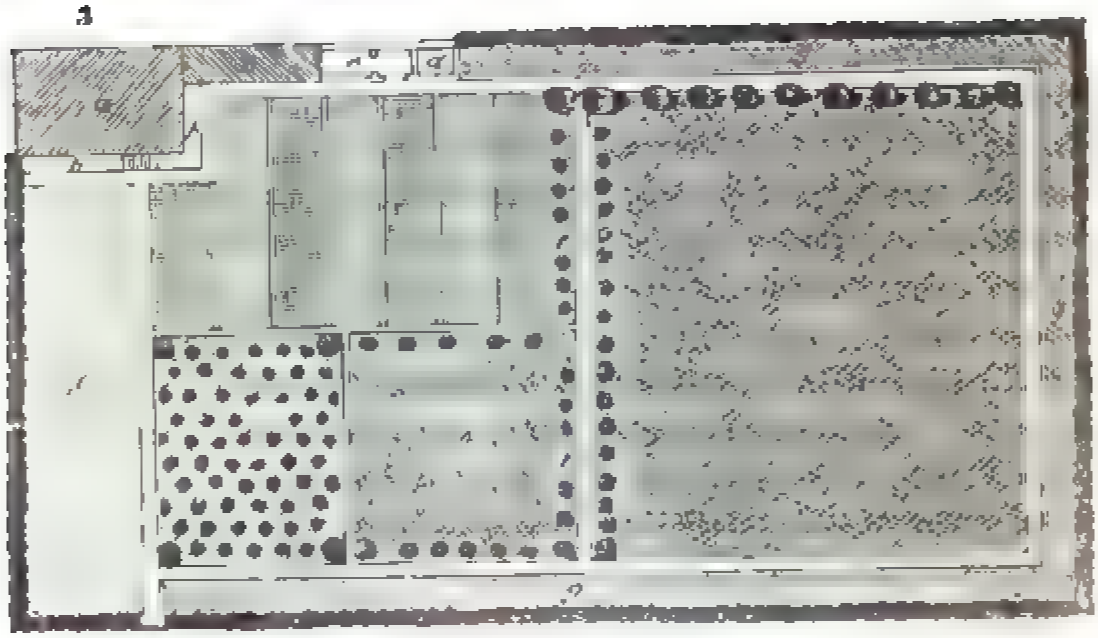

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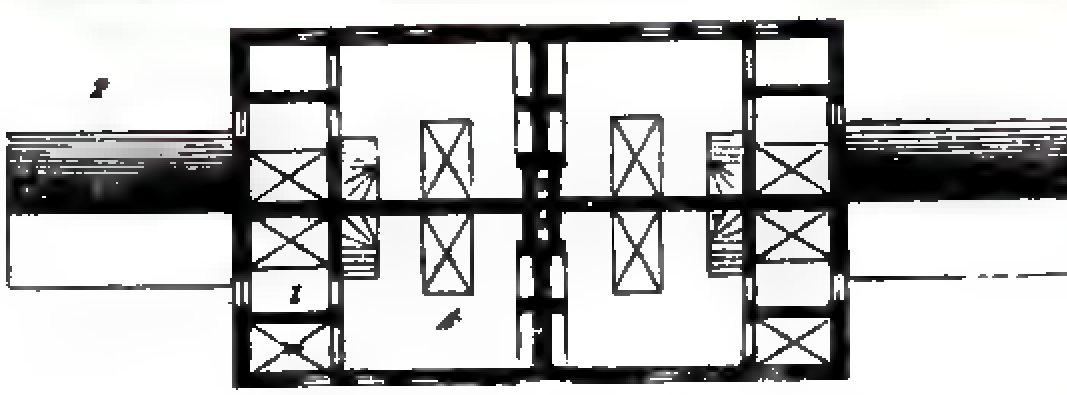

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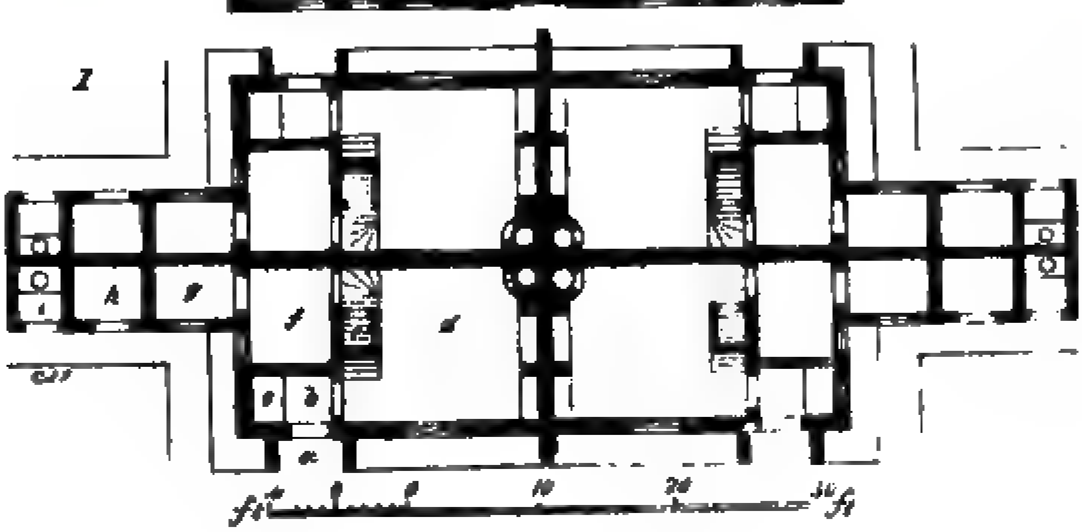


become established. For the *second* early crops forty-folds Champions, and Bread-fruits are the best. Plaut these about the same time as the others in rows, the distance apart, but the sets require to be six inches from each other in the row. When these crops of potatoes are all gathered, the ground may be occupied with spinach or Coleworts.

A small portion only of the border (*g*) would be required for growing herbs, which should be confined to half of the southern part, and the remainder of the southern might be occupied with Wilmot's and Watson's Rhubarb, the western border might be planted with Keen's seedling Roseberry, and Grove End Strawberries; the northern part should be occupied with the Red and Yellow Antwerp Raspberries. The dwarf apple trees at (*f*), and also on the opposite side of the walk, should be planted about four feet from the walk, and fifteen feet apart, from tree to tree; the sorts most to be recommended are the Keswick Codlin, Hawthorndean, Mank's Codlin, Norfolk Beaufin, Bess Pool, Northern Greening, Blenheim Pippin, and Gravenstein. It would also be advisable to plant about four standard plum trees; these should stand two at the top and two at the bottom of the Garden; the sorts most suitable are 1 Catherine, 1 Early Orleans, 1 late Orleans, and 1 Shropshire Damson for preserving and wine. On the borders, round the quarters, gooseberry and currant trees, should be planted about eight feet apart, from tree to tree, and four feet from the walk. The late potatoes need not be planted till May, "if it be even as late as the middle, there will be no fear of a crop, if properly managed." After they are taken up, as nothing more can be planted upon the same ground that will be off in time for the next year's planting of potatoes, the best way will be to dig the soil in ridges and allow it to remain so through the winter.

(Fig. 4). is a geometrical elevation of one side of the building, which will be found of great use to the builder. I name this upon the supposition, that a skilful workman will be able to complete the erection without the assistance of any other drawings than the accompanying ones.

(Fig. 25) is an isometrical view of the building, and part of the garden, &c., showing the effect of the whole. It will be readily agreed, on reference to this view, that a number of such buildings would present very interesting objects upon a nobleman's or gentleman's demesne.

The material to be employed in the external walls of the building, will depend much upon local circumstances. If brick is the material used, there will be a very great saving by making the walls hollow, as I

have noticed in Vol. I, p. 355. The external walls may be eleven inches thick, which will be quite sufficient; and the runners in that case must be placed so as to leave a vacuity of two inches in the centre of the wall. As a brick is only nine inches long and four and a half broad, the transverse bricks, or headers, must be flush on the outside, which will leave an uneven surface on the inside; but this is all the better as supplying a means for the plaster to take a good hold. The foundations must be solid, and a brick and a half in thickness; and the earth must be well rammed round them.

The bearing timbers may be of elm or of larch, and the rafters of the principal roof should be four and a half by three-quarter inches. The roof is to be covered with terrometalic Italian tiles; these are of an iron colour, which is much preferable to those of a glaring red colour. The chimney stack is to have lateral openings, as shewn in the view, and be covered with iron coloured tiles; the shafts to be coated with cement. The windows are to have perpendicular wooden mullions or astragals, and to turn round on a pivot and socket in the centre at top and bottom, see Vol. I. p. 153. The porches and window dressings may, for the sake of cheapness, be of wooden work, painted of a stone colour. All the internal finishing should be executed in the strongest and plainest manner; and all the external wood work ought to be painted four times in oil. The internal divisions may be of brick on edge, or of brick nogging flat; but if the building is situated where wood is abundant they may be of lath and quartering, as the roof is wholly supported by the external walls.

The expense of this building, including the offices, if the walls are of brick work—the roof covered with terrometalic tiles, and the joiner's work finished in a strong but plain manner, will be about £408, or £102 each house. If the external walls are built of stone work, that is, quartering framed as if for internal divisions—wattled with small branches of trees between the quartering, and the spaces filled in with mud, the expense will be greatly lessened, especially where wood can be had cheap; but, perhaps, brick (or stone if cheap) walls will be found more economical in the long run.

The situation most proper for such a building must depend upon many circumstances, but it will be of no use to erect it where the soil is not particularly good for the gardeners, so as to repay the labour bestowed on them; and if there is an opportunity of choosing a situation as to effect, I should say, that from its characteristic as an Italian structure, it might be advantageously placed in rather a low than an elevated situation. But wherever the situation may be, the

building must be so placed that a line running north and south will be a diagonal of the parallelogramatical form of the ground plan; and, above all, in a situation where there is an abundance of good spring water. A dial may be very properly placed on the South East side of the building shewn in the perspective view; and the gardens to be well fenced in by a thorny hedge, as exhibited by the drawings.

THE CONDITION OF THE BRITISH PEASANTRY, AND THE MANNER OF IMPROVING THAT CONDITION CONSIDERED.

The first thing necesssary to the comfort and happiness of mankind, after food and clothing are provided, is a comfortable home; but until the former are supplied the labourer's dwelling can afford him but little pleasure, however neat and commodious it may be. It is, therefore, the duty of those who have it in their power, to forward every measure that may tend to the support of their fellow beings; because, the law of Nature and that of reason have recognised the principle that every individual has a right to a share for his sustainance of the products of the soil he inhabits; and those who deny this principle by pertinaciously withholding the means by which their peasantry might be brought from a state of starvation and misery, to that of comfort and happiness, enter as it were a protest against that power which sustains nature for the joint benefit of all.

As every man, with the exception of the aged and infirm, is capable of producing more than what is necessary for his own support, it is for the privilege of his being allowed fully to exercise his capacity, for doing so that I implore the landowner of Britain in behalf of my fellow labourers. The want of employment is the great drawback to the comfort and happiness of agricultural labourers; and, consequently, their want of means greatly affects the operative manufacturer, as the former would, were they able, be great consumers of the productions of the latter. While we see that this want of exercise to dormant labour increases the poor's rates, and prevents the increase of the country's wealth, is there no remedy for the evil? Is the science of agriculture perfect, which, under the present existing laws, is our only refuge from starvation? Is the country sufficiently broken by hedge rows to mark out the divisions of property, to preserve it, and prevent encroachment? Are there no drains, ditches, or fences wanted, which would enhance the value of the land, and make it more productive? Are there no waste lands that might advantageously be reclaimed from rivers, by deepening their bed and narrowing their width? Are there no small canals that might be profitably made

for the conveyance of stone, lime, gravel, marl, fuel &c., so as to be the cheapest mode of transporting such material from place to place, until rail-roads become more in vogue? But above all, are there no waste lands that might render food for men? Yes, can it be believed, that while thousands are in want of food, there are in this country between fourteen and fifteen million acres of land of a fertile soil which have never been disturbed by spade or plough; and between thirteen and fourteen million acres of barren and boggy land, a great part of which might be made productive! True it is that much of this land is required for the support of cattle, but it is equally true that many of these cattle do no good direct or indirect to the community, and much of this land serves no useful purpose whatever. Again, are the houses of the farmers and peasantry in general not in want of repair? Indeed, no part of the country offers greater scope for improvement than the dwellings of agricultural labourers.

The accompanying design might be built, in a district where wood is abundant, much cheaper than the amount of the estimate, as I have already observed; but even if built of brick, the interest for the outlay of capital, supposing each occupier to pay as rent only £5. 10s. per annum, would be about 5½ per cent.

In addition to what I have already said, a great deal might be done to employ the labourer by planting; this would be a great source of wealth to the inheritors of the estates on which it is extensively practised, as there is always a demand for timber; and ultimately we might produce that useful material as cheap as importing it from America, Norway, Memel, &c. Much might also be done by enterprising landlords in combining together and forming rail-roads, common roads, and extensive canals through the interior of the country, for the more speedy conveyance of manufactures.

It may here be asked where the capital is to come from to effect all these improvements, but with enterprizing landlords this can seldom be an obstacle, as the majority of them are wealthy; and those who are not so fortunate can easily borrow money on their estates, which the improved condition of the latter would enable them to repay; and all estates left to minors should have the overplus of rental, after a moderate sum for their support, expended in improving the estates, until the heir comes of age. Enterprize and resolution are alone wanting to effect the whole. It is indeed a hard case when by misgovernment, and mismanagement one fellow being is obliged to

"Beg a brother of the earth,
"To give him leave to toil!"

and yet his petition is rejected. It is for this reason we could wish

to see the petitioners on a more independent footing, which might be done by extending the cottage system, (at least until we have effected an abolition of the corn Laws,) which would prevent the peasantry from literal starvation when out of employment. And as I am of opinion that the foregoing sources of employment would be equally advantageous to the employer and employed, I would here notice that the cottage system would be equally profitable to the landlord and tenant; because the extra trouble with small occupiers would be more than balanced by the extra proportionate rent that they would be able to pay. I am the more anxious to impress this fact on the minds of proprietors, as I am rather sceptical on the point of many landlords giving themselves much trouble about any system by which they have no immediate interest. But in this case the landlord may benefit himself, and at the same time have the pleasure of bestowing those favours which both "bless the giver and receiver." For the efficacy of the cottage system, we have only to look to the good effects produced by the *Labourer's Friend Society*, to Fredric's Ord. in Holland, America, to Jamaica, to France, Hungary, and indeed to all the continental countries of Europe, and there we shall find the good effects produced by this system.

I cannot conclude this subject without noticing that great source of all physical power, and moral worth—education. I consider it necessary to occupy a little space with a few remarks on this head, because wealthy persons in general are, from a mistaken notion, more ready to withhold than to impart education to their dependants. It is true that there are many valuable Institutions in this country for teaching youth the elementary principles of knowledge; but it is too frequently the case that the system of education generally adopted, and what is understood by the name of education is not such as to address itself to the mind and feelings so as to require an exercise of the mental faculties*. Neither does it tend to the developement; exercise, and adaptation of physical strength or dexterity. In many schools in Germany, branches of different professions and trades are taught to youth, as well as the mere elementary principles of learning, which latter, are at best but the means of acquiring education. What is

* Knowledge and Wisdom, far from being one,
Have ofttimes no connection. Knowledge dwells
In heads replete with thoughts of other men;
Wisdom in minds attentive to their own.
Knowledge, a rude unprofitable mass,
The mere materials with which Wisdom builds
Till smoothed, and squared, and fitted to its place,
Does but encumber whom it seems to enrich.

Cowper's Task, Book vi.

wanted is not a mechanical scholar but a reasoning one; and when we reflect that all learning resolves itself into knowledge we cannot but see that the adult, as well as the youth, is in equal want of mental training. The importance of this subject makes it the interest and duty of every wealthy individual, to look after the moral intelligence of his dependants; for while we have every proof that knowledge is power, we have also reason to believe that it produces virtue and happiness; and whatever can be said in favour of any country, springs directly from the intelligence of its inhabitants. No one can have any doubt that in proportion to the intelligence of a people, so is the proportionate decrease of crime, and consequently an increase of happiness: this fact may be readily established by reference to the great change in the state of Society for the last century, which is wholly attributable to the spread of knowledge. If the landowner examines the many instances of incendiarism in this country for the last few years, he will find that they have all been perpetrated by persons of the grossest ignorance. If further proofs were wanting to shew the advantage of knowledge to a country, we have only to compare the skill and industry of the labourer and artizan of the present day with that of those of former times, who were under the yoke of feudalism, which held them in slavery and ignorance. That knowledge will make the labourer discontented in his station has been too frequently urged by the wealthy; but can it be possible that an intelligent body of men will adopt such irrational measures as an ignorant people; and have we not daily proofs that the greatest depredations are committed by persons the most ignorant, while intelligent men are generally peaceable and valuable members of society. But even were all the community educated, there would still be the same relative difference between individuals, according to their organization, industry, or other circumstances; so that instead of having as we have now, the illiterate and intelligent, we should then have the well instructed individuals, and the philosopher. As the children of the labourer are destined to be the future servants of the wealthy, this alone ought to command attention to their education; because experience has taught us that in the majority of cases, the best servants are those who are best informed. There is no wrong like that of shutting out knowledge from the human mind; and those who do so have not even the plea that they have in withholding their wealth; for when they bestow it they impoverish themselves in proportion as they give away to their neighbour; but no individual by imparting knowledge ever diminished his own store, but rather increased it. It requires great judgment to communicate intelligence with effect, for ignor-

ance is always obstinate and difficult to be removed; but if the land-owner would encourage the education of his peasantry by forwarding every measure for instituting education establishments for youth, such as those in Germany, his labours would be sure to meet with success and reward. The best means for extending information to grown-up persons is by establishing village libraries. These should be by no means free, as the poor have a singular prejudice against any thing that is given them for nothing; and if each member, therefore, even paid but a halfpenny or penny a week, it would make them feel more independent than if admitted gratuitously.

In conclusion; I may state that I have imperfectly run over what appears to me the means by which the melioration of the British peasantry may be effected; and I again implore the wealthy to adopt some measures for the relief of their starving dependants. To those who have drank like milk the tears of the miserable and wretched—to those, who for love of wealth have hardened their hearts that neither grief nor distress can move them—to those who have shut their ears and hands to the petitions of the poor—I have nothing to say, they are past being moved,—and must be left to the rapacious desires of their own hearts, which will ultimately take vengeance upon them for the calamities they have inflicted on others. But to those who are open to reason and a sense of justice I would say, that the importance of their trust is far more than the dignity of their station. If they expect justice to be done to their estates—if they expect a continuance of that labour discharged with fidelity, by which their dignity and grandeur are supported, they must give diligence its due reward, and secure the gratitude of their dependants by ministering to their wants: tyranny may create fear, but it never can command affection.

The landlord who exercises much consideration in behalf of his peasantry has no need to fear the incendiary; security will encircle his dwelling; and above all, he will be at peace with himself, by being conscious of having acted wisely with those goods of which he has been appointed a distributor; and when the gnawings of the tyrant's heart will torment and distract him, he who has acted the part of a feeling and natural father to his people, shall establish his soul in peace.

London, February 16th, 1834.

P. S.—In my paper on the Scarf, the sense of one passage is destroyed by misplacing the points. See Vol. 2, page 522, 23rd line from the bottom.

"The mandibles opened and shut, as if gasping for breath. In order to retard the flight of the remaining spark of life so rapidly winging its way, I pushed a herring head towards them with a small cane &c. **"

It ought to read thus:—

"The mandibles opened and shut, as if gasping for breath, in order to retard the flight of the remaining spark of life so rapidly winging its way. I pushed a herring head &c."

ARTICLE XII.

ON THE NATURAL SHEDDING OF THE SPRAYS OF FOREST-TREES.

An Extract made on Reviewing a Treatise on the Nature of Trees, and the Pruning of Timber Trees; showing the impossibility of increasing the Quantity and improving the Quality of Timber by Pruning.

BY STEPHEN BALLARD.—12*mo*. 2*s*.—67 *Pages*.

MR. BALLARD is a sensible and intelligent writer, and reasons very judiciously on the advantages of the system he advocates. The Work is divided into seven chapters; the first of which treats on the Nature of Trees, wherein is stated the power of trees to evade the force of the wind.—Balancing boughs.—Property of assuming the best shape, &c.

Chapter 2nd.—ON THE NATURAL SHEDDING OF SPRAYS.—"Trees have the power of pruning themselves; all useless branches die, and drop off. In many kinds of trees, the quantity of branches thus disposed of during the time a tree is coming to maturity, is much greater than the quantity retained, when at maturity. This may, to some persons, seem unlikely; but let it be considered, that the circumference of the head of a tree, proceeds almost from a point; and that the extremities of the branches have been, at some part of the tree's life, in every part of the space within the limits of the space occupied by the head of the tree when at maturity. And let it be remembered how close the twigs, or small sprays, are situated to each other round the head of a tree; and observe how close the whole inside space, within the extremities of the branches, would be filled, had all these small sprays remained on. If this be well considered, some idea may be formed, of the immense number of sprays pruned off in this natural way, by means of this power of discontinuing sprays in such situations as are no longer suitable; and of the advantage the tree has of forming itself in the best possible shape for its situation.

Let the pruner, before he commences his attack upon a tree, observe that its branches are selected, or chosen, from a number many times as great as the quantity left, and that they are the selected few found by experience to be well situated. If he pause and consider this but a little while, he will be humbled, the insufficiency of his judgment will appear, and he will estimate his abilities more according to their value.

I fear that my attempts to show the existence of this natural pruning, may not, to many, appear sufficiently clear; and, therefore, I will endeavour to explain more fully; for certainly if it be shown

that trees themselves observe, and practice, a system of pruning off useless branches, it must be a strong argument against any interference on the part of man, and especially if man be ignorant of the tree's power of performing the work itself.

I find it difficult to express my ideas sufficiently plain for the general reader, at the same time, am anxious to make known to all, what I have observed in the nature of trees; and if my endeavours fall short of what I wish, still I have hopes that my observations may call the attention of some to the study of the subject. If those concerned in the growth of timber, would but apply themselves to the investigation of the nature of trees; disregarding any old-fashioned dogmas relative to their management, that may have been handed down to them, they would gain much more extensive information than it is possible to gain from a book. I, therefore, earnestly entreat the cultivators of timber, to apply themselves to the subject, which is now so little understood.

There seems to be a singular want of knowledge, patiently endured, respecting the nature of trees. The investigations of the physiologists are unfortunately confined too much to the internal organization of the sap vessels, and the motion of the sap, and not extended, so much as they should, to the rules, and circumstances that regulate the external form and developement of trees. As a proof of the great want of knowledge of the nature of trees, I need only instance, how little the necessity of selection of trees to be transplanted is, even at the present day, known, and that it was almost wholly unknown before the publication of Sir H. Steuart's valuable book, the Planter's Guide. But to return to the subject of natural pruning. A person who has not contemplated the subject, will hardly believe that the number of sprays retained by a full grown tree, bear but a small proportion to the quantity that tree has, itself pruned off. Now to show that this must be the case, let us trace the growth of a tree—suppose an Oak, from the seed to maturity. The first year's growth of a tree from the seed is, generally one perpendicular shoot; the second year, side branches are, most likely formed within a few inches of the ground; this to be sure, depends on the situation of the plant: but a young tree does not proceed, at any rate, far, without side branches. These side branches are, each successive year, extended, and multiplied; so that by the time the tree has attained the height of eight or ten feet, it has many tiers of branches; extended and divided into numerous small sprays. The growth continues; the head, each years extends—the stem thickens—and, let us suppose the tree has reached the height of forty feet. We now find it covered with innumerable sprays, closely filling up the

spaces round the circumference of the head. The size of the tree continues to increase; the proportion and symmetry of its make, are maintained at all times; and we see, when it has arrived at the height of eighty feet, with a stem probably five feet diameter, its stem and branches bear the same proportion to each other, that they did when the height was forty feet. Compare it now with what it was when but forty feet in height; at that height it had sprays to the number very likely of one thousand: look to the full grown tree, and imagine a space within its boughs equal to the size of the tree at forty feet height. Observe how many boughs the full grown tree has in this space, and you will immediately see what an immense number of sprays must have been shed. The large limbs extend, perhaps several feet from the stem without any subdivision. There are now no limbs branching out from the stem, within ten feet of the ground; but when the tree was but eight feet high, it had many tiers of branches, extended and divided into many small sprays; and when the tree was still younger, the side branches spread out from the stem within a few inches of the ground. What is become of them? Now, there is not a side branch within ten feet of the ground. The space formerly filled by the stem, branches, and the whole of the young tree at eight years of age, is now occupied by the huge, solid, and beautiful stem of an Oak; not a sign of the side branches, so numerous in the young tree, can be seen, they are all vanished, only the leading shoot remains, and that enlarged to such a size that it bears not the slightest resemblance to what it was in its youth.

Some imagine that whenever a stem is free from branches, it is owing to pruning or to the browsing of cattle; but this is not the case, it is natural to a timber-tree, be its situation what it may, to have a certain portion of its stem clear of branches.

There are no pruners in the uncultivated forests from whence we have the long pines and deals imported, with often thirty or forty feet of clear stem before the branches begin. These trees have grown without the assistance of the pruner; and they have shed boughs that were far above the reach of cattle. These forests clearly prove that trees have the power of shedding such sprays as are useless, or unnecessary, for a tree could not reach the height of thirty or forty feet without a great number of branches. It must have branches when but a foot or two high; the number and size of these branches must increase as the tree increases in height, and a tree thirty feet in height, must have a great number of branches; yet we have the stems of trees thirty feet high without a single branch. How do the advocates for pruning reconcile this to their philosophy, will they

assert that the stem is stretched or protruded, so that the boughs, first situated near the ground are, by the growth and lengthening of the stem, lifted up farther from the earth? this they cannot say: yet they will have great reluctance in admitting the existence of this natural shedding of sprays, for no person who well understands it will ever prune under the idea of improving the shape or increasing the quantity of timber.

It has been stated that it is natural to all trees to have a certain portion of the stem free from branches. The length of the stem clear from branches depends on the situation of the tree. In proportion as the situation is exposed the stem is shorter; but, if it were possible to have a tree grow up to maturity, without ever having its lower boughs either cut off, or destroyed by other trees or bushes, that is, if the ground round about the tree were entirely without any other vegetable whatever, and the situation were open and at the same time the tree protected from any thing that could injure its lower boughs, a tree so situated would, when at maturity, have a portion of its stem free from boughs.

The manner in which the boughs are shed, is much more perfect in some trees than in others. The Oak effects it in the most complete manner. Every one who has at all turned his attention to the growth of the oak, must have observed a number of dead sprays lying under the trees; but the authors of all the works I have read, relating to the management of trees, have omitted to notice these naturally shed sprays.

If the end of one of these sprays be examined, it will be found to resemble the end of the footstalk of a leaf, where it has naturally separated from the spray; it also has an appearance something like the end of a buck's horn, where it has separated from the head of the buck. The shape and appearance of the part that has separated from the tree will convince any one that it is a natural division. The end of the spray is a little convex, and entirely without that jaggedness attending the fracture of living sprays. Now it is after this natural pruning only, that a union takes place between the old and new wood; although many pruners buoy up and encourage themselves with the idea, that the old and new wood unites, where their clumsy operations have been performed: for clumsy indeed, are the operations of the pruner in comparison with those of nature. I may be accused of a want of courtesy; but there is little due to those, who have the assurance to take upon themselves the correction and improvement of a thing, the nature of which they are so ignorant of, as to be unacquainted with the power of trees to discontinue such

sprays as are in situations no longer provided with the necessaries for the use of sprays.

If I have succeeded in the attempt to show the necessity of sprays being shed, let not any pruner, blinded with his own sufficiency, imagine this circumstance in favour of pruning. Perhaps it may be said, that it is shown that pruning is a natural operation in the growth of trees, and man, when he performs the work, is assisting nature. But nature does not want this kind of assistance. The only way in which nature can be assisted in the growth of trees, if assistance it must be called, is by improving the situation, and increasing, or bettering the food of the tree. As for instance, the growth of a tree may be encouraged by the removal of surrounding trees; by improving the soil in which it grows; or by protection from any injury it may be liable to. The knife cannot be used on the live part of a tree without inflicting an injury, and lessening the growth. The sprays that drop off of themselves are not shed because they were robbers, but because their situation had become, by the growth of surrounding sprays, unfit, by being made too limited or too dark. Nor do the pruners know which sprays have sufficient room when they cut away so unhesitatingly? If they cut away sprays where there is room for their growth, they, in addition to the injury, by the irreparable blemish inflicted in cutting the wood, retard the growth of the tree. And if they cut away sprays that would of themselves drop off, their labour is useless, and most likely injurious, as the sprays would be removed before there was any necessity. It is worthy of remark, that the young shoots, which seldom fail to show themselves after the pruner's operations, are never to be seen where sprays naturally separate themselves from the tree. All kinds of timber trees practice this natural pruning, but few, that I have observed, in so perfect a manner as the Oak."

Chapter 3rd.—On the power of trees to send forth sprays in every suitable situation. *Chapter 4th,* commences with pruning, wherein he maintains that all pruning necessarily affects and retards the growth of trees. *In Chapter* 5th.—The author maintains that no timber is improved in quality by pruning, but on the contrary, is of less value than that which never was pruned. [See our extract on this subject page 191.] *In Chapter 6th.*—Pruning to improve the shape is treated on and deprecated as useless; and lastly, advice is given on cutting down timber. Although the subject of pruning has been much investigated, both in our *Register* and various other works, and the majority appear to advocate early and judicious pruning, and although Mr. Ballard condemns pruning altogether, not as

being merely useless, but absolutely injurious, yet we recommend the perusal of his little work to all who are interested in Forest Tree culture.

NATURAL HISTORY.

ARTICLE XIII.—ON THE DIFFERENT FORMS OF THE NECTARIUM.

BY F. F. ASHFORD.

SEVERAL of these have been cursorily mentioned as characters of the genus, but though this part of the flower has not hitherto been observed in many genera, yet it may in all probability exist in all, if not a distinct visible part as a gland, or pore, or a set of glands, or pores exuding that viscid sweet juice, so useful secondarily for the nourishment of a great variety of insects, and at the same time, doubtless primarily necessary to the fructuation of the plant itself. For it may be observed in monopetalous tubulose corollas, that though they have no visible nectary, yet there is a nectareous juice, secreted in their tube, which is therefore probably provided with glands for this purpose, too minute to be seen with the naked eye, but which an accurate inspection with glasses, might perhaps detect. Polypetalous flowers, with open calyxes, having no tube or basin for the reception of the nectarious juice, have in general a body destined to prepare and contain it, in order that it may be distributed to the surrounding parts of fructuation as it is wanted. In the compound and umbellate tribe of plants indeed, no nectaries have been remarked, but then it must be remembered, that the whole flower in both of these is so small, that it is no wonder if a part so minute as the nectary frequently is in larger flowers, should escape our observation. In these we may presume, however, that they abound in nectarious juice since we observe that insects are particularly fond of these tribes. No genus in the 12th class has any distinct nectary, but then the calyx is one leaved, and forms a commodious basin, for the reception of the nectarious juice which is frequently discernable in it. The verticilate tube (Class 14 Order 2) also is not mentioned by Linnæus as being furnished with visible nectary, nor is that perhaps necessary here, because the coralla is monopetalous, and the monophylous calyx forms a permanent tube. Many genera of this order have a gland in the bottom of the calyx, surrounding the base of the germ. This is large in the bugle and sufficiently visible in the dead nettle.

No appearance of the nectary is more common than in the form of glands, thus Plukenetia has four glands at the base of the filiments, as in the fifteenth class. Cereis has a style form gland under the germ, Orobanche has a gland at the base of the germ, Cassytha has three

glands, Echites five, Hernandia has four or six surrounding the germ, and Grielum has a set of oblong glands round the germ uniting into a little crown, Malpighia has two glands at the bottom and out side of the calyx, in Banisteria, the case is the same, except that one folide of the calyx has no glands, and therefore the whole number is eight instead of ten. Reseda has a gland, arising from the receptacle between the stamens and the upper petal. Croton has five of them fixed to the receptacle, Astronium has five in the disk of the flower, Cucurbita has a single triangular concave gland in the centre of the flower, and in Salix the situation is the same but the form cylindric.

Another usual form of the nectary is scales, which are nothing but flatted glands, Vicia has one scale only at the base of the germ, Cusscuta has four at the base of the stamens, but many have five scales as Parnasia, at the base of the filiments in Quassia, between the stamens in Iresine at the base of the germ in Crassula, surrounding the receptacle in Samyda, or at the base of the petals in Ranunculus. Amaryllis has six scales without the base of the filiments.

Not unfrequently does the nectary appear in the shape of valves, which are generally five in number; in Plumbago placed at the bottom of the corolla and inclosing the germ, surrounding the germ in Achryanthus, and covering the capsule in Campanula. Asphodel has six of these valves inserted into the base of the corolla, and forming a complete arch over the germ a filiment springing from each of them.

In Erythronium, there are two callous tubercles at the base of each inner petal; in Laurus, three tubercles round the germ, and two round glands on a short stalk near the base of each filiment of the inner rank, in some species of Iris there are three dots at the base and on the outside of the corolla; in Tamus an oblong dot grows to the inside of each division of the calyx and in Swertia are ten of these dots, two at the base of each division of the corrolla, in Hyacinthus there are three pores at the top of the germ, and in Frittalaria, there is an excavation at the base of each petal, which is considerable, and generally exhibits a large drop of nectareous juice. Mercurialis has two subulate acumens or sharp points, one on each side of the germ, and Vallisneria has cuspis on each petal.

The nectary makes a most beautiful appearance in some species of Iris as a longitudinal villous line upon the petals, in Lilium, it is a pipe or a tubulose line, along the middle of each petal, and Frankenia it is a channel running along the claw.

In some genera the nectary takes the exact form of petals, and was always confounded with them until Linnæus pointed out the differ-

ence. This is the case with several plants of the 1st class, and with Lecythis in class thirteen; with all these it is of one petal, in Galanthus it consists of three parallel, notched, obtuse, petal-like leaflets forming a cylinder, about half the length of the corolla. Illicium has several awl shaped folioles of the same length of the petals themselves. Cardiospermum has a four petaled nectary inclosing the germ, Hartogia of five petals. Andrachne has five semi-bifid herbaceous folioles, less than the petals, and placed between them all the Grasses, Rice, and Mays, agree in having a nectary of two oblong minute leaflets. Melianthus has a one leaved nectary within the lowest division of the calyx to which it grows. In Musa, one boat shaped leaf compressed, pointed, and inserted within the bosom of the petal. Ten converging leaflets inclosing the germ form the nectary of Zygophyllum, each leaflet being fixed to the base of each filiment. Dalechampia has a broad nectary composed of many ovate flat plates in several rows. In many genera with tubular corollas, there is a horn or spur at the back of the flower which answers the purpose of a recipient, as in Delphinium, &c. In some species of Anthirrinum the horn is blunted, and becomes rather a bag which is also its shape in Satyrium. In Ophrys, it hangs down from the corolla longer than the petals, and is keeled in the back part; in Serapius, it is of the same length of the petals, of one leaf concave, standing on a pedicle and within the lowest petal; in Arethusa, it is of one leaf, tubulose at the bottom of the ringent corolla, and connate with it, in Cypripedium, is very large and inflated, and in Epidendrum, it is tubulose at the base, turbinate with an oblique bifid mouth. Thus it is observed that all the genera of this tube have singular nectaries, whereas in the third classes (16, 17, 18,) with conjoined filiments, scarcely any are to be found. The numerous genus Carex has an inflated permanent nectary, contracting above and toothed at top, where it gapes, but continues to invest the seed, in Ruscus also it is inflated, and open at top, it is ovate, erect, and of the same size of the calyx:

In many genera, the nectary takes the form of some well known utensil, or other thing; thus in Staphylea it is urceolate or pitcher shaped; in Narcissus, it is infundibiliform, or funnel-shaped; in Epimedium it is cyathiform, or goblet shaped; in Ayenia, it is bell shaped, in Cissampelis, it is well shaped, and in Epidendrum it is turbinate or top shaped narrow at bottom, and spreading out above. The most beautiful of these is the crown shaped; in Diosma, this is placed on the germ; in Olax, it terminates the corolla, but in Passiflora, it is a triple crown, the outer one longest surrounding the style.

In Garidella, the nectaries are five bilabiate ones. Trollius has nine linear flat bent bodies, perforated at the base on the inside; Isopyrum has five equal tubulose short nectaries, with a trilobate mouth inserted into the receptacle within the petals.

In Arum, the nectaries resemble the filiments of stamens, only that they thicken at bottom; they come out in two rows from the middle of the spadix; in Peganum, the filiments themselves are dilated into nectaries at the base; in Fevilea, they consist of five compressed bent threads placed alternate with the stamens; in Trichilia, the nectary is cylindric and tubulose, formed out of the ten filiments shorter than the petals with a five toothed mouth. By this time it will be observed, that many nectaries already mentioned have an intimate connexion with the germ, it is a situation so common with this part of the flower that some persons have suspected the sole or principal use of it is to supply and foster the germ. Accordingly there are several other genera in which it is thus placed; in Mirabilis, it is permanent, globose, and incloses the germ; in Cissus, it is a ring sounding the germ; in Cynanchum it is cylindric with a five-toothed mouth; in Apocynum, Asclepias, and Stapelia it is made up of five bodies, which in the second, and last entirely conceal the stamens and pistils, and in the last also forms a double star, all of them about the germ, in Gaultheria; it is made up of ten short awl shaped crest bodies surrounding the germ about the stamens.

It must not be dissembled, that of whatever use these bodies may be to the germ when they adhere to it, or are near it, they are frequently found on other parts of the fructification. Many instances of this have already occurred, and to these we may add, that they are found on the petals in Bromelia, growing to each of the three above the base; in Berberris in two roundish orange coloured bodies at the base of each; in Hermannia each petal having a little membrane, altogether forming a cowled tube; Hydrophyllum, in Cumina or plates growing to them, and in Myosorus being five awl shaped bodies. The nectary is a globose gland on the exterior tip of the anthera; in Adenanthera, at the base of them; in Ambrosinia, on the filiments, in form of glands; in Dictamnus, in form of scales; in Zygophyllum placed horizontally on the filiments; in Plumbago, and lastly, the nectaries are not unfrequently placed on the receptacle as in Clutia, and some others; but these are so close to the germ, which takes its rise from the same base that they may very well be supposed to be placed there for its use.

But what shall we say when we find the nectary in the incomplete staminiferous flowers, which have no germ, as in Salix, where it certainly cannot be of any immediate use to the germ, which is not only on a distinct flower but on a different plant; this however being the most important part of the vegetable, since it is destined by nature to produce a new one of the same kind, and all the other parts of the flower being subservient to this, in some measure, whatsoever is immediately useful to these may fairly be said to be immediately serviceable to the germ.

Hitherto we have observed, that this beautiful part of the flower is generally single, though in many cases formed of several portions. In some genera, however, it is double; in Krameria, there are two nectaries, one above another; in Paullinia, there are also two, but differing from each other, one consisting of four petals inserted into the claws of the real petals, the other four glands at their basis, Clusia has two sets of nectaries one within the other.

In my next, I shall commence a description of the Linnean Classes and Orders, with a figure of each class.

COLLECTIONS AND RECOLLECTIONS.

ARTICLE XIV.

On a New Method of Writing on Zinc, for Labelling Plants.—Mr. Henry Braconnot, the celebrated French Chemist of Nancy, to whom we are indebted for the curious transformation of rags and other similar vegetable substances into starch, gum, and sugar, by the agency of Oil of Vitriol, and whose name is well known in the chemical world for various researches connected with the analysis of vegetable substances, has given in the last number of the Annales de Chimie et de Physique, a preparation for writing on plates of zinc to label plants. The writer having a dislike to painting in oil, which is often inconvenient, and never endures a long time, resolved to turn his attention to some other way which would prove both ready and durable. The system of writing on zinc with a black crayon, which was accidentally discovered by M. Symon an Amateur at Brussels, and noticed in the *Revue horticole* for October 1832 and the *Bon Jardinier* for 1833, possessing many imperfections, Mr. Braconnot to try some experiments, being anxious to obtain a liquid, or a species of ink, which would be perfectly durable when exposed to the changeableness of the weather, and also one with which he could write with ease. This end, after several proofs, he is induced to believe he has in a great measure attained. If it answers he will have done both the botanists and amateurs a real service. The preparation is as follows:—

Take Verdigres in powder one part,
Salamoniac in powder one part,
Lamp black (Mori de Fumea) half a part,
Water ten parts;

Mix these in a glass or pot mortar, at first only adding as much water as will mix it well, then add the remainder of the water, when placed in a vessel, let it be well shaked up from time to time and in a few days it will be ready for use. This is not only excellent for labelling plants, but also for marking objects it is wished to preserve in low, wet, situations, and for marking key, becoming quickly dry and being very durable.

T. HARDCASTLE, PRINTER, CHURCH-STREET, SHEFFIELD.

1 Pontia Brassicæ 2 Pontia Napi 3 Pontia Rapæ
4 Limax agrestis 5 Platygaster ovulorum

THE

HORTICULTURAL REGISTER,

SEPTEMBER 1ST, 1834.

HORTICULTURE.

ARTICLE I.—A FEW REMARKS ON THE CULTURE OF THE CABBAGE (BRASSICA.)

THE Cabbage is well known and universally cultivated; the varieties and subvarieties are so numerous and bear in some cases so little resemblance to each other, that it would scarcely be credited that they have sprung from one common origin.

Mr. De Cadolle has given in the Horticultural Trans., Vol. 5, a new arrangement of the cultivated species of Brassica, which is as follows;—

1. Sea Colewort or Cabbage, or Wild Cabbage.
2. Greens, Kale or Borecoles.
3. Savoy-Cabbages.
4. Cabbages Red and White.
5. Chou rave or Turnip-stemmed Cabbage.
6. Cauliflower and Broccoli.

The common red and white Cabbages only will be treated on in the following remarks, the other divisions will be the substance for a future paper. The sorts most to be recommended, when a selection is desired, are:—

Early York	Dwarf American
Early Dwarf	Vanack
Early Emperor	Imperial
Well's Early	Early Battersea
Young's Early	Red Dutch

Of these Early Emperor, Well's Early, Young's Early, and Dwarf American, are new and very valuable; indeed the Early Emperor has been pronounced by some gardener's the very best early Cabbage grown, though we do not think it surpasses the other new sorts named with it. The Vanack is considered new by many, but this is a mis-

take, it has been cultivated many years, and had nearly come into disuse. It is a most excellent sort when obtained true, probably surpassed by none either new or old, and with judicious sowings is always in season.

The best soil in which to sow Cabbage seed is one somewhat light, and except for early crops, not very rich; indeed where seedlings are intended to stand on the beds for transplanting in the spring, the land is better rather poor than otherwise; and if somewhat stiff, it will be no worse, as it prevents the plants being cast out during sharp frosts.

Perhaps no vegetable, to bring it to perfection, requires more nourishment than the cabbage, and therefore a piece of good rich loamy soil should always be selected to plant upon, a large quantity of well rotted dung being dug into it.

Always plant in an airy open situation, for they will not thrive under the shelter and drip of trees, but invariably draw up weakly, and seldom form any hearts.

Those planted out in the Autumn, to come in for use the following spring, must have a well drained soil, and a situation somewhat sheltered from cutting winds, but fully exposed to the influence of the sun.

Towards winter, if the young plants be top-heavy, draw a little earth round the stems with the hoe, but if they will stand upright, it is better to avoid doing any thing at them, except loosening the soil and keeping down weeds, for by drawing earth round the stems, the slugs will have more shelter, the shanks become long, and very often the plants cabbage later.

All the sorts are raised annually from seeds, and from their liability to be impregnated by bees, &c. during the time of flowering, many good sorts are often spoiled by cross-breeding. There is often seen in our gardens, a great variation in one crop, when the seed has been known to be gathered from an excellent and true sort.

There are four principal seasons for sowing to form herds, and several more times for coleworts,

The first sowing takes place about the end of February, or beginning of March; for this season we would recommend Young's, Well's and Vanack. These are intended to come in for use in July and August, which will immediately suceed those sown in the preceding Autumn.

As soon as these plants are of a sufficient size, which will be in May, transplant them on an open rich quarter, in rows eighteen inches apart in the rows, and two feet from row to row, taking advantage of showery weather for the purpose. Should the spring be dry, they must be regularly watered. Occasionally stir the soil round

them, both to encourage the growth of the roots, and also to destroy the weeds, and when they begin to be top-heavy draw a little earth around the stems.

The second sowing takes place in April, the sorts to be recommended now are Young's, Well's, Vanack, Imperial, Early Battersea, and Dwarf America. These will come into use the beginning of August, and will continue down to winter. Their treatment is the same as mentioned for the last, except that the Battersea and Imperial will require planting two feet apart in the rows.

The third sowing is made in May. These come in late in the Autumn, and for winter use. The sorts most suitable for this sowing are such as heat quickly, as the Early York, Early Dwarf, Early Emperor, and the like. The greater part of these are often cut as coleworts, many of them scarcely being able to form good heads before winter overtakes them.

The fourth season is the principal one for Spring Cabbages, and takes place in July and August. It is not every sort that is fit for sowing in July, because of the liability to run, but the Vanack, and Young's Early are exceptions, and may be sown any time about the 20th of the month. The Early York, Early Dwarf, Early Emperor, Well's Early, and Early American, may be sown during the first and second weeks in August.

As soon as they are sufficiently advanced in growth, prick them out. Those sown in July will be ready to plant out for winter in the beginning of September, and those sown in August will be ready to plant out by the end of September. This may be on the ground that was occupied by early potatoes.

Always make it a rule not to occupy the same ground with cabbages two successive years.

The seasons for sowing Coleworts are towards the middle of June, the middle of July, and the beginning of August. Always select for this purpose the quick heating sorts, as the Early York, Early Dwarf, Early Emperor, &c. As soon as coleworts are cut, always pull up the stalks, and by cutting each row, and clearing it away, the ground can be occupied with something else.

The culture of the Red Cabbage is much the same as that for the White. The season for sowing is August, and the heads are fully formed by August in the following year; to succeed these sow in March, and transplant two feet six inches apart.

Cabbages may also be raised from slips and cuttings of the first shoots formed after the heads are cut. "The slips when taken from the stalks, are exposed a sufficient time to the sun and atmosphere,

to cauterize the wounded part. In the summer, twenty-four hours are sufficient, and two or three days in winter: rubbing a little wood-ashes on the part greatly assists in cauterising the wound, and prevents, bleeding. Plant them, and they require no further trouble." See Gardeners' Magazine, Vol. 9 page 227, and our *Register* Vol. 2, 275. It is, however, probable this system will not be much practised except in particular cases, though we do not doubt but it will answer.

Insects.—Amongst the most destructive insects that infest Cabbages are the caterpillars of the Large Cabbage Butterflies (Pontia Brassicæ) figure 1 on the plate, the Green-Veined White (Pontia Napi) fig. 2, and the Small Cabbage Butterflies (Pontia Rapæ) fig. 3. The first of these appears early in spring when the plants are small, when if not destroyed they usually make great devastation. The two latter seldom do much damage until June or July, when they get into the hearts of the plants and quickly spoil them. The only sure way of getting rid of these, is to gather them off with the hand, or destroy as many as possible whilst in the chrysalis state.

Slugs are also very troublesome, but these may be destroyed by dusting lime over the ground at the time the are travelling about, as noticed Vol 1, page 166. The Limax Agrestis fig. 4 is one of the most common.

Whilst the plants are young, they are sometimes bitten off by a brown grub about an inch and a half long. A mixture of strong lime water, mixed with tobacco water, and poured at the roots, will effectually kill this grub; besides this we know of no other way except catching them. Many other insects infest the Brassicæ tribe, but as we shall have occasion again to enter into the subject we pass over the remainder, and merely notice, that many thousands of the caterpillars are destroyed annually by a small insect of the Ichneumon Family which is named on the plate as Platygaster ovulorum, but which we have since understood to be the Microgaster glomeratus. This minute insect the figure of which is the natural size, deposits its eggs in the bodies of the caterpillars, some time after which the caterpillars cease to feed, and leaving the cabbages, usually crawl up any wall near, and there instead of going into the pupæ state, become transformed into a number of little silken balls, as seen on the plate. from these in a few days issue a number of the perfect insects.

There is something wonderful in the instinct of these little insects, that when feeding on the body of the caterpillar they should avoid touching any vital part, that should take the caterpillars life; and when full grown that they should eat through the skin, to spin their cocoons without killing it, although none live more than a few days afterwards.

ARTICLE II.—LONDON HORTICULTURAL SOCIETY.

SINCE our last report, the ordinary Meetings for June and July have taken place, as well as the Exhibitions announced to be held at the Society's Garden on the 7th and 5th of the above months. At the ordinary meetings, the novelties, have not been very numerous, but the subjects have been extremely good of their kinds. Of these we may especially enumerate the specimens of Lilium japonicum and spectabile, Pentstemon speciosus and splendens, the China Roses, Elichrysum splendens, varieties of Petunia, Sollya heterophylla, Caprifolium Japonicum and flexuosum, Gilia tricolor, Cycnoches Loddigesii and Stanhopea oculata. The collections of fruit have included a seedling Pine Apple (Buck's No. 2,) many varieties of Gooseberry, Elton Seedling Strawberries, Vines in fruit from Mr. Mearns, raised from coiled rootless shoots, and the Elton, Downton, Black Eagle, Belle de Choisy and Tilgner's red heart Cherries; this latter is a sort imported by the Society from Germany, exceeding both in quality and in its produce as a standard the red-heart in common cultivation.

The Elton Cherry was as usual found of first rate excellence. We observed for the first time also a very prolific hybrid Cherry between the Waterloo and the May Duke, raised by T. A. Knight, Esq. At the Meeting on the 15th of July, a paper by Mr. Knight was read upon the causes of the diseases and deformities of the leaves of the Peach tree, and an extract of a letter was communicated from Lord Grey, of Groby, in which he very handsomely stated his intention of placing at the disposal of the Council an annual medal for the rarest orchideous or parasitical plant which shall be exhibited to the Society by any Gardener or Nurseryman, during the year. The Garden exhibitions were if possible more attractive than before, and gave the highest gratification to about 3000 visitors on each occasion. The fruit and flowers were in admirable condition, and reflected much credit on the skill of the cultivators who entered into competition for the Medals, which were awarded as follows:—

THE GOLD BANKSIAN MEDAL.—1. For Grapes and Pines exhibited by *Mr. Dowding*, Gardener to Lady Clarke. 2. For a miscellaneous Collection of Flowers, from *Mrs. Lawrence, F.H.S.* 3. For Garden Roses, from *Mr. T. Rivers*, of Sawbridgeworth.

THE LARGE SILVER MEDAL.—1. For Garden Roses, from *Mr. Stephen Hooker, F.H.S.* 2. For a miscellaneous Collection of Plants, from *Mr. Seward Snow*, Gardener to J. H. Palmer, Esq. *F.H.S.* 3. For Stove and Greenhouse Plants, from *Mr. John Green*,

Gardener to Sir E. Antrobus, Bart., *F.H.S.* 4. For China Roses, from *Mr. Stephen Hooker*, of Brenchley, F.H.S. 5. For Pine Apples, from *Henry John Grant Esq. F.H.S.* 6. For Pelargoniums, from *Messrs. Colley and Hill*, of Hammersmith. 7. For Forced Fruit, from *Mr. W. Deas*, Gardener to the Duke of Norfolk, *F.H.S.* 8. For Forced Eruit, from *Mr. Hugh Fraser*, Gardener to Sir. C. Sullivan, Bart., F.H.S. 9. For Alströmerias, from *Charles Barclay, Esq.* F.H.S.

THE SILVER BANKSIAN MEDAL.—1. For Roses, from Messrs. Rollisons, of Tooting. 2. For a miscellaneous Collection of Plants, from Mrs Marryat. F.H.S. 3. For Rhododendrons, from Messrs. Waterer, of Knap Hill. 4. For American Plants, from Messrs. Waterer, of Knap Hill. 5. For Pelargoniums, from Mr. Wilson, of Clewer Lodge. 6. For Heartsease, fromMr. Geo. Glenny, of Twickenham, F.H.S. 7. For Calceolarias, from Mr. John Green, Gardener to Sir E. Antrobus, Bart., F.H.S. 8. For Ranunculuses, from Mr. Henry Groom, of Walworth, F.H.S. 9. For Balsams and Cockscombs, from Mr. Cock of Chiswick. 10. For Pinks and Piccotees, from Mr. Hogg, of Paddington. 11. For a new Frontignan Grape, from Mr. John Wilmot, of Isleworth, F.H.S. 12. For Strawberries, from Mr. C. Knevett, of Turnham Green. 13. For Cucumbers, from Mr. Seward Snow, Gardener to J. H. Palmer, Esq. F.H.S.

THE GOLD BANKSIAN MEDAL.—1. For Grapes, from Mr. John Wilmot, of Isleworth, F. H. S. 2. For a miscellaneous Collection of Plants, from Mrs. Lawrence, F. H. S. 3. For China and Noisette Roses, from Mr. Rivers, of Sawbridgeworth. 4. For Garden Roses, from Mr. Stephen Hooker, of Brenchley, near Lamberhurs, F. H. S.

THE LARGE SILVER MEDAL.—1. For a miscellaneous Collection of Plants, from Mr. John Green, Gardener to Sir Edmund Antrobus, Bart., F. H. S. 2. For miscellaneous Fruits, from Mr. George Mills. F. H. S. Gardener to Alexander Copland, Esq. F. H. S. 3. For Pelargoniums, from Messrs. Colley and Hill, of Hammersmith. 4. For Dahlias, from Mr. Hopwood, of Twickenham. 5. For Dahlias, from Mr. Redding, Gardener to Mrs. Marryat, F. H. S. 6. For an Envile Pine, from Mr. John Wilmot, of Isleworth, F. H. S. 7. For Queen Pines, from Mr. William Greenshields, F. H. S., Gardener to R. B. De Beauvoir, Esq. F. H. S. 8. For Melons, from Mr. John Wilmot, of Isleworth, F. H. S. 9. For Peaches and Nectarines, from Mr. John Mearns, F. H. S., Gardener to the Duke of Portland. 10. For Carnations, from Mr. Hogg, of Pad-

dington. 11. For Heaths, from Messrs. Rollissons, of Tooting. 12. For English Piccotees, from Mr. Hogg, of Paddington. 13. For Grapes, from Mr. Turner, Gardener to Byng, Esq, F. H. S. 14. For China Roses, from Mr. Stephen Hooker, F. H. S. 15. For miscellaneous Roses, from William Harrison, Esq., F. H. S. 16. For Cockscombs, from Mr. Falconer, Gardener to Archdale Palmer, Esq. 17. For Orchideous Plant, from Messrs. Rollissons, of toothing. 18. For Balsams, from Mr. John Green, Gardener to Sir Edmond Antrobus, Bart., F. H. S. 19. For Elichrysum, sp. from Robert Mangles, Esq. F. H. S.

The Silver Banksian Medal.—1. For Heartsease, from Mr. Wilmer, of Sunbury. 2. For Peaches and Nectarines, from Mr. Bradley, Gardener to the Earl of Arran, F. H. S. 3. For Cucumbers, from Mr. Seward Snow, Gardener to John Horsely Palmer, Esq., F, H. S. 4. For Currants, from Mr. John Wilmot, of Isleworth, F. H. S. 5. For Black Hamburgh Grapes, from Mr. R. Clews, of Action, F. H. S. 6. For Grapes, from Mr. Andrews, Gardener to R. Patterson, Esq,, of Blackheath. 7. For Bigarreau Cherries, from Mr. Jarvis, of Turnham Green. 8. For Melons, from Mr. Davis, Gardener to ——— Strange, Esq., Upton, Essex. 9. For Perpetual Roses, from Mr. Rivers, of Sawbridgeworth. 10. For Roses, from Mr. Wilmer, of Sunbury. 11. For Piccotees, from Mr. Wilmer, of Sunbury. 12. For Pelargoniums, from Mr. Gaines, Surry Lane, Battersea. 13. For Balsams, Cockscombs and Dahlias, from Mr. William Cock, of Chiswick. 14. For a miscellaneous collection of plants from Mr. Redding, Gardener to Mrs. Marryat, F. H. S.

ARTICLE III.

OPERATIONS IN THE FRUIT DEPARTMENT FOR SEPTEMBER.

Apple Trees.—Since the various species of caterpillars mentioned last month, page 341, go into the pupa state towards the end; our readers should follow the directions there given, any time before the middle of the month.

Buds put in during last month and July will require their bandages loosening.

Cherry Trees.—If they are infested with insects, follow the directions given last month. The morellas will require netting, to preserve the fruit from birds. Those in pots for forcing, if the wood be ripe, should be placed under a north wall.

Figs on the open walls being now ripe, refrain from watering till the fruit is gathered; those in pots must still be supplied with water.

Gooseberry Trees infested with caterpillars, now the fruit is gathered, should be treated as recommended last month.

Peach and Nectarine Trees.—The fruit being now ripe, although infested with the red spider or other insects, all operations must be suspended, until after the fruit is gathered. They may then be treated as recommended page 342; repeating it two or three times. Treat those in pots in the same manner as recommended for cherries.

Pear Trees, if infested with the slimy larvæ, dust on a dry day with quick lime, and, in a few days afterwards, wash the trees clean by means of a liquid. This must be done before the fruit begins to ripen.

Plum Trees, infested with the Aphis, as soon as the fruit is gathered, use the mixture recommended page 342. The best time to apply it, is the first thing in the morning, and late in the afternoon.

Raspberries, if troubled with the Aphides, wash with some soap suds and tobacco-water, in the proportions of one gallon of the latter to four of the former.

Strawberries in Pots keep free from runners; and plant new beds in good strong loam.

Vines in Pots being now brought into the vinery, will ripen their fruit at the end of January.

VEGETABLE DEPARTMENT.

Broccoli sown last month should be transplanted out to produce heads next April and May.

Carrots sown last month should be properly thinned out, and a little more seed sown in the beginning.

Cauliflower Plants will be ready to prick out towards the end of the month, for sheltering in frames; the reader may also pot a score or two in sixty-sized pots and plunge them in the same frame.

Cabbage Plants should be planted out early in the month, in rows twelve inches apart, and six inches from plant to plant. Prick out in beds those sown last month.

Celery will require earthing up as it advances in growth.

Endive may be planted out two or three times in the month.

Herbs fit for cutting should be gathered in fine weather.

Lettuces should be planted out for use in October. Sow seed three times during the month, for preserving through the winter.

Mushroom Beds should now be generally made.

Normandy Cress should be sown early in the month.

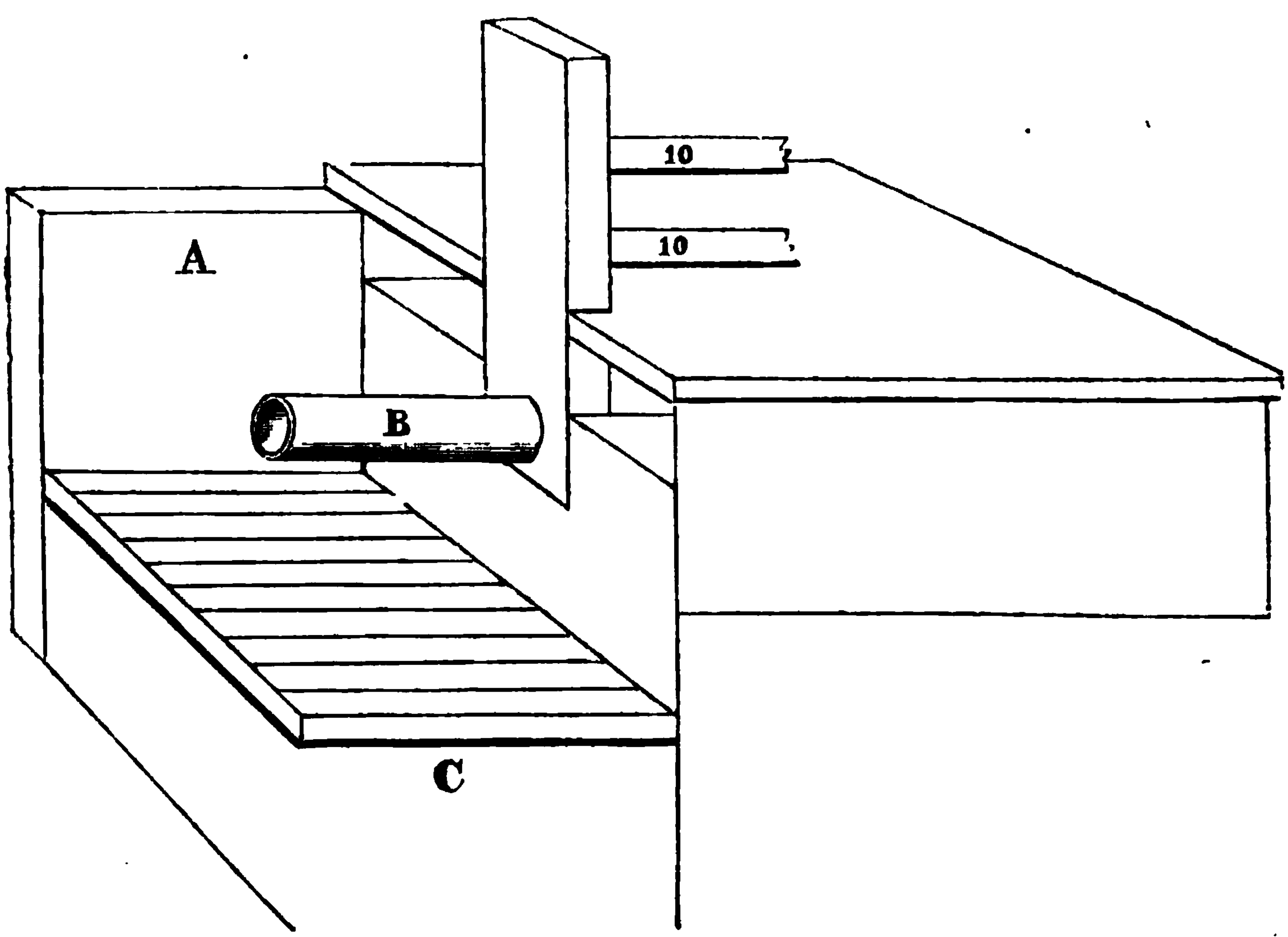
Welsh Onions if not sown in August, should be sown as speedily as possible.

ARTICLE IV.—A FURTHER EXPERIMENT ON HEATING HOT-HOUSES WITH HOT-WATER.

BY MR. SAUL, SULYARD-STREET, LANCASTER.

In page 136, of your Magazine of Botany, you have given a plate of my hot-water apparatus, and you state that you will resume the subject shortly. Having made another experiment by removing the two pipes (8, 8,) as shown in the *Horticultural Register* Vol. 1, page 586, and fixed one pipe eighteen inches long, and four and a half inches diameter, inside measure, see fig. 26 (*b*). I enlarged the fire place (*a*) and made the grate flat, as (*e*), and to my great astonishment, I was never able to obtain one half the heat, although I had increased the size of my fire-place so much.

26



It is therefore, quite clear, that small tubes or pipes placed in the same way, as in Vol 1, page 586, and page 136 of your Magazine of Botany, are far better than one larger pipe, as fig. 26 (*b*). Also it is a great advantage for the grate (*b*), to be on an inclined plane, and not level as (*c*).

Conscious of this, I have removed the pipe (*b*), and replaced the two pipes, also the inclined plane, and by this means, I am able to obtain the heat you named in my former papers on the subject. It is by small tubes, that the engines on the railways, obtain their great heat, and I believe that small pipes will answer better than large boilers for heating hot-houses, because of the little time required to procure the heat.

FLORICULTURE.

ARTICLE V.—CULTURE OF AZALEAS.

All tender Azaleas require one general mode of treatment as follows:—

Pot them as soon as they have done flowering, which will be about the end of May, except those intended to be left for seed, which must remain until they have ripened their seed.

Use a mixture of equal parts of sandy loam and peat, with a small portion of leaf mould, in preference to all peat; and be careful in potting to give a good drainage of broken potsherds; for although they delight in moisture, stagnant water usually proves injurious to them.

About the middle of June, place them in a somewhat sheltered and shady situation, out of doors.

Allow them to stand in this situation till September, then remove them into a pit or greenhouse, in any airy situation, until they are wanted for flowering.

It is a great assistance to them, when about expanding their flowers, to remove them into an increased temperature; this should be from sixty to sixty-five degrees Fahrenheit, and the plants may be introduced about the middle or end of September, which will come into flower towards the end of October, and will continue blooming till December; others brought in the middle of October will continue flowering till January; those brought in the end of November will continue flowering till February, when those in the pit or greenhouse will commence flowering, and continue till May.

When they are in flower, a good supply of water is requisite, to enable the plants to support them; any deficiency in this respect will cause the flowers speedily to fall.

When they have done flowering, assist them by every means to make young wood, a good supply of which must be secured before they are removed from the increased heat. For this purpose, syringe them about once or twice a week, and after they have grown considerably, remove them to the greenhouse, previous to their being turned out of doors, and treat them like other greenhouse plants, merely giving them a good supply of air and water.

When the young shoots are from four to six inches long, they are best calculated for cuttings. Take them off after the plants are removed to the greenhouse; separate each cutting close to the old wood from whence they start, trim off no leaves but those which grow on

that part intended to be inserted in the pot. They must be planted in either sand or light soil, the former is the best; plunge the pots in a little heat, and place a hand-glass over them, and in the course of a fortnight or three weeks they will strike root.

When they have struck root, transplant with balls into single pots, filled with the compost recommended for the old plants, and again plunge them in a little heat until they have begun to grow, after which they may be removed to the greenhouse, and be treated like other greenhouse plants.

Many of the greenhouse species and varieties will bear a good degree of cold, and will thrive very well if planted under the wall of a stove, greenhouse, or other warm situation; but in winter they must be sheltered by mats from the effects of frost. The Indica Phoenicea flowers most beautifully, when planted out in the border of a conservatory; it will there grow from four to six feet high, with a good supply of water, and slight shade.

Hardy species and varieties require little care; they may either be grown on a bed or otherwise to suit the fancy of the cultivator. Always select for them a situation somewhat shady and rather damp, but by no means one where water stagnates, unless a good drainage be laid underneath.

In all dry summers a good supply of water is advantageous, though not indispensable; but plants so treated always thrive more than under other circumstances.

Some of the species produce abundance of seed, which may be sown in pans or pots as soon as gathered; place them in a shady situation, and keep them rather moist, until they vegetate.

As soon as they are of a sufficient size, transplant them into other pots, and place them under a glass, and let them be slightly shaded until they have again started. Then expose them by degrees, until they are hardy enough to be planted out.

The hardy species and varieties are also readily propagated by layers and cuttings. The branches in layering merely require pegging down without any tongue, and a regular supply of moisture administered. The cuttings may be taken off precisely in the same manner as recommended for the greenhouse species and varieties; but, instead of planting in pots, they may be planted under a hand-glass, on a shady border.

The Azalea is scarcely separable from Rhododendron, with regard to the number of stamens, some seedlings raised from Azaleas having only five stamens, have themselves possessed ten, and even more, whilst seedlings raised from Rhodedendrons have had less than ten

stamens, and in other respects have very nearly resembled Azaleas.

The generic name is given from the natural habitation of the plants, many of the North American species growing in dry steep declivities, or on dry plains, where for a long time they can scarcely receive any moisture.

ARTICLE VI.—NEW AND RARE PLANTS,

FIGURED IN THE PERIODICALS FOR AUGUST.

CLASS I.—PLANTS HAVING TWO COTYLEDONES.

SCROPHULARINÆ.

LOPHOSPERMUM RHODOCHITON.—Purple Lophospermum, a climbing suffrutescent plant, with funnel shaped purple flowers, an inch and a half long, hanging gracefully down. It is a native of Mexico, and was introduced to Germany about two years ago, and from the Royal Botanic Garden at Berlin, it has found its way into the collections of this country. It may be increased by seeds and cutttngs, and will require the same treatment as the L. erubescens, and is apparently quite as hardy as that species.—*British Flower Garden.*

POLEMONIACEÆ.

DIAPENSIA LAPPONICA.—Lapland Diapensia. This Plant was raised at the Botanic Garden, Edinburgh, from seeds gathered on the Rocky Mountains of North America, by Mr. Drummond, in the last expedition of Captain Franklin. It flowered in April, having been kept in the open border, and occasionally covered with a hand-glass. —*British Flower Garden.*

CAMPANULICEÆ.

CAMPANULA GARGANICA.—Garganian Bell-Flower. This pretty little blue-flowering Campanula was discovered by Professor Tenore, on Mount St. Angelo, anciently Garganus, in the kingdom of Naples, and was named by him after that locality, to which it appears to be peculiar. It is admirably adapted for Rock work, and appears to thrive best in a mixture of peat and loam. It is readily increased by divison. As the plant is apt to suffer from too much wet, I would recommend one or two to be kept in pots in the frame during winter. —*British Flower Garden.*

LEGUMINOSÆ.

ACACIA HASTULATA,—Little Halbert-leaved Acacia. This Species was discovered by Mr. Menzies, in King George's Sound, and in the same country by the late Mr. Fraser. The Yellow blossoms are delightfully fragrant, smelling like Hawthorn.—*Bot. Mag.*

CARYOPHYLLEÆ.

SILENE VIRGINICA.—Virginian Catch fly. Although this species is stated to have been introduced to our collections by Messrs Loddiges, in 1783, it is exceedingly rare. The flowers are Red.—*Bot. Mag.*

GROSSULACEÆ.

RIBES NIVEUM.—White-flowered Gooseberry. An undescribed species, brought to the Horticulture Society by Mr. Douglas, from North-west America. It is nearly allied to the common European Gooseberry, from which it is distinguished by its long conical stamens.—*Bot. Reg.*

COMPOSITÆ.

DIPLOPAPPUS INCANUS,—Hoary Diplopappus. A handsome half shrubby species, discovered in California, by Mr. Douglas, by whom seeds were sent to the garden of the Horticultural Society, in 1832. Its flowers are of a rich lilac, with a bright yellow disk. The species is rather tender, and should be protected, during winter, in a frame. In Summer, it grows freely in any hot, exposed situation, for which its California Constitution particularly qualifies it.—*Bot. Register.*

HYDROPHYLLEÆ

PHACELIA TANACETIFOLIA.—Tansy leaved Phacelia. This is a hardy annual, with purple flowers, thriving in any soil or situation. It is a native of California, where its seeds were gathered by Mr. Douglas.—*Bot. Reg.*

LABIATÆ.

STACHYS INFLATA.—Bladdery Stachys. This plant was raised in the Garden of the Horticultural Society; but the label being accidentally lost, it is uncertain of what country it is a native. Mr. Bentham conjectures that it has come from the North of Africa, which is rendered the more probable by its having been growing near some plants obtained from Egyptian seeds, presented to the Society by Mr. Greenough. It is apparently hardy, and grows freely in any common garden soil, and is easily propagated by cuttings. Although it is not a very handsome plant, yet its thin half transparent light violet flowers, and neat hoary leaves give it a pleasing appearance.—*Bot. Reg.*

ERICEÆ.

ERICA CODONODES.—Bell-bearing Heath. This species of heath has the general appearance of E. arborea, a plant which is a great ornament to rocky places in the south of Europe, where it grows intermixed with different kinds of Cistus and the wild Arbutus. It

begins to blossom in February, and continues, till the end of May, disregarding both frost and snow, being often covered with flowers from top to bottom, and forming a most beautiful object. It thrives in light sandy peat, and is increased, but with difficulty, either by cuttings struck in sand under a bell glass, or by layers bent down in July.—*Bot. Reg.*

CLASS II.—PLANTS WITH ONLY ONE COTYLEDONE.

ORCHIDEÆ.

DENDROBIUM AGGREGATUM.—Clustered Dendrobium. Received, according to Dr. Roxburgh, into the Botanic Garden, Calcutta, from Mr. Pierard, who found it growing on the trunk of Lagerstræmia Reginæ on the Northern border of Aracan, and observed it in the woods exclusively on that tree. It was, however, found to thrive on the Mango tree in the Botanic Garden. It appears to require as much heat and moisture as any of the Indian species, a circumstance which is explained by its inhabiting, when wild, the damp and sultry woods of Martaban.—*Bot. Reg.*

ARTICLE VII.

ANCIENT AND MODERN TASTE IN FLOWERS.

BY VIOLA.

THERE are few circumstances, perhaps, that tend to place ourselves and our ancestors in stronger contrast, than the present passion for new and lovely varieties in flowers, compared with the simple tastes in them, which our forefathers possessed;—and which are rarely now to be traced, but in the pages of their nervous old poetry.

While looking over a few of the various floricultural periodicals, and admiring the galaxy of beauty, which they present to all lovers of glorious nature, and successful art,—I was forcibly impressed with this contrast, and could not resist a little tendency to speculate upon the probability, or rather improbability that any of these lovely specimens of nature's loveliest productions, would find one poet,—in this age of verse-making,—to celebrate their beauty, and hand down his own name and theirs' to posterity. Two reasons militate against this; one is, that in the present *high pressure* state of society, competition, necessity for novelty,—and the endless variety of objects that daily multiply around us,—all require increased powers of language, to keep pace with the fresh calls that are continually made upon it. The other reason is, that the noblest, sweetest best of lan-

guage, has already been lavished on the lowliest, simplest flower—the daisy:* nothing remains then, to devote to the gay and gorgeous strangers that astonish modern eyes. Our poets may imitate, they cannot originate anything in language so exquisite as Chaucers. Our poets may admire;—but where shall we look for a description of doting love for a favourite flower, to compare with those that are scattered through his works?

Many hundred readers have dwelled with delight upon the lines by Wordsworth "to the daisy," and beautiful they are; but how poor—how lukewarm—how insipid, when put in comparison with the out-pourings of our glorious old poet! Thus he writes in his "Legend of good women."

"Now have I this condition †
That of all the flowers of the mead,
I best love those flowers white and red,
Such as men call day's eyes in our town:
To them I have so great affection,
As I said before, when coming in is May,
That in my bed there dawneth me no day
That I'm not up, and walking in the mead,
To see this flower against the sun spread,
When he upriseth early by the morrow:
That blissful sight, softeneth all my sorrow.
So glad am I when that I have presence
Of it, to do it all reverence.
It is of all flowers—the flower:
Always fair and fresh of hue;
And ever shall I love it, and find it new;
And ever shall till my heart shall die.
† † † † ——— ——— ———
And when it is evening I blithely run
As soon as the sun beginneth to go west,
To see how this flower will go to rest.
† † † † ——— ——— ———
Its chere‡ is plainly spread in the brightness
Of the sun; for in that it will unclose:
Alas! that I had English rhyme or prose
Sufficient, for this flower to praise aright!
† † † † ——— ——— ———
My busy spirit that thirsteth always new
To see this flower so young and fresh of hue,
Constrained me with such greedy desire
That in my heart I yet feel the fire
That made me rise e'er it was day;

* Day's Eye.

† To avoid taking too much space in the *Register*, I have given only a *free translation*, omitting the original, in its primitive and simple dress.

‡ Countenance.

And this was now the first morn of May
With timid heart, and glad devotion
To be at the resurrection
Of this flower, when it should unclose
Against the sun, that rose as red as rose;
And down on knees, then I me set
And as (well as) I could, this fresh flower I greeted,
Continuing to kneel, till it unclosed was,
Upon the short, soft, sweet grass."

Again, in the "Cuckoo and the Nightingale," this advice is given:

"You use (quoth she)—this medicine,
Every day, this May, before you dine,
Go look upon the fresh daisy,
And though thou be for wo, ready to die,
That shall full greatly lessen thee of thy pine."

Chaucer's innocent simplicity of language, and child-like earnest love for this lowly favourite—the first that is sought, and eagerly grasped by the hands of infancy,—is to me, perfectly exquisite. The plain homely style too,—how beautifully in keeping with, and perfectly adapted to his subject! What hope then, can we indulge, that the modern Flora will find appropriate eulogists?—Alas—none! For language will not keep pace with machinery—we have not yet acquired the art of making verses by steam: hence ye gorgeous Dahlias, ye magnificent Cacti, ye soft-eyed Thunbergias, ye delicate Plumbagos, ye glowing Justicias, ye velvet petalled Gloxinias,—ye must ever wear your gay colours in despair.—No Chaucer lines for you! The little cheerful upturned eye, that we thoughtlessly crush in our path,—this weed—to watch whose daily awaking, our first of poets was drawn from his bed,—has monopolised the sweetest and the best of poetry.

July 15th, 1834.

ARTICLE VIII.

OPERATIONS IN THE FLOWER-GARDEN FOR SEPTEMBER.

Azaleas cuttings planted in July, will now probably require potting off.

Camellias, if wanted to flower early, should be taken into the greenhouse the end of this month, or beginning of October. Grafting and budding too, are often performed upon them at this time, but we prefer the spring season.

Carnations, layered last month, will require potting off.

Calceolarias, cut down in July, will begin to flower about the end of the month. Place them in an airy part of the greenhouse.

China Rose cuttings strike very freely now, if planted under a hand-glass, on a south-east or south-west aspect, and are potted off in the spring; but they become fine plants in much less time, when planted in spring.

Chimonanthus fragrans may still be increased by layers and cuttings.

Cyclamen persicum, if not turned out of the pots into a sheltered border, should be turned out as early in this month as possible.

Greenhouse Plants of several kinds may still be propagated by cuttings.

Mignonette, to stand the winter in pots, if not sown last month, should be sown as early as possible.

Orange and Lemon Trees, may still be propagated by cuttings.

Pink pipings, put in last month and July, if properly struck, should be transplanted in beds to remove in the spring. Pot off a quantity of one year old plants to force.

Ranunculuses, planted in frames towards the end, will flower from Christmas to the middle of January.

Ten Weeks Stocks, sown in pots early in the month and sheltered in frames, will flower early in the spring.

Primula prænitens (sinensis Lindl.) cuttings of this plant may be put in about the end of the month.

Cactuses of all sorts should now be taken into the greenhouse. See page 117.

Spomopsis elegans, now sown, will probably flower better than those sown at any other season; see page 221.

Isotoma axillaris.—The seeds of this plant may be sown to flower in the following May.

Hyacinths may be planted the middle of the month.

Schizanthus may also be sown, and treated as recommended, page 287.

Viola Tricolor. The seeds of this plant, gathered any time before the end of the month, should be sown immediately.

ARTICLE IX.

TO CULTIVATE STOVE FERNS.—By Mr. Marnock.

The following is a tolerably successful method of raising Stove Ferns from seed;—

Fill any convenient sized pot with sandy peat earth, and on the top allow a few pieces to rise above the rest.

When this is done, merely shake the seeds on the top and sides of these pieces. It will be readily understood, that the minuteness of the seeds requires this precaution, for by sowing them in a pot on a level surface, the whole of the seed would be subjected to the same kind of treatment, which might happen to be either too wet, or too dry; indeed, it is not impossible even with the greatest care, that both may occasionally happen.

The soil in which the seed is sown ought to be scalded with boiling water, in order to kill any seeds of the common hardy kinds that may accidentally have found their way into the soil, such as *Aspidium Filix-mas*, and some others, which, even with this precaution, will not unfrequently intrude themselves.

They seldom succeed so well in a close frame in a cool part of the stove, where evaporation can be most effectually prevented; and they will by no means endure to be continually kept close under bell glasses.

Water must never be applied to the surface of the pots; but by keeping the pots in feeders which contain a little water, they will generally keep themselves sufficiently moist.

NATURAL HISTORY.

Article X.—A FEW REMARKS ON THE NEW THEORY OF THE DEPOSITION OF DEW.

BY J. B. JUN.

In page 293, I perceive your correspondent, G. I. T. has, amongst other reforms in science, introduced a total and radical one on the deposition of dew, which is there stated to depend on certain powers possessed by living vegetable bodies as conductors of electricity; entirely overthrowing the ingenious theory of Dr. Wells, which since its discovery has been found fully sufficient to explain all the circumstances attending that phenomenon, and which in my mind, at least, still remains unshaken.

The theory of dew being deposited on plants by their power of

conducting the electric fluid, I cannot for a moment entertain, when I consider the simple fact, that silk, wool, and feathers, are all non-conductors, and yet become dewed as readily as plants.

G. I. T. is no doubt fully aware, that it is possible for the surface of the earth to become colder than the surrounding air; for owing to the transparency of the atmosphere to the rays of heat, those rays which are given off by the earth are not again radiated to it by the surrounding air, but are lost in space; and thus it is that the temperature of the surface is lowered.

By your Correspondent's leave, I beg to make a remark or two on the arguments by which this theory is supported. And first, the surface of the ground is *thought* to be changed by some secret agency, in one case it is the attraction, and as the source of heat is etherial fire" (which I suppose is but another name for caloric)" *that* fire is first attracted by the points of vegetable bodies." Now I suspect the most likely circumstance to attend this absorbtion of heat by any body would surely be, that the temperature of the absorbing body would be raised; yet in direct contradiction to this, we are told that the surface of the earth becomes colder! Also the abstraction of heat, when the clouds are suppossed to be the attracting bodies, causes an elevation in the temperature of the earth's surface!

I should notice but one more of the arguments produced in support of this theory; I allude to that part where the fact of metals not becoming dewed is advanced in proof of this theory, when in truth they always appeared to me to furnish a most convincing proof of the correctness of the theory of Dr. Wells. We read in page 299, of plants "not being endued with the power of radiating or conducting heat in a degree by any means equal to that of metals, substances, which, it is said, do not become dewed at a time and under circumstances wherein the circumjacent herbage is covered with minute drops of water,—a fact which is not only very remarkable in itself, but one which affords convincing proof that plants do *not* become dewed solely by their power of radiating heat." Here plants are said not to possess the power of radiating *or* conducting heat in an equal degree with metals; this to a person uninitiated would appear as though the powers of radiation and conduction were the same, when on the contrary they generally follow an inverse ratio.

Also instead of metals being better radiators than plants, they are always considered to be the worst radiating bodies known; and *their not becoming dewed is, in* my judgment, *a fact no ways remarkable in itself, but one which* I should say *affords convincing proof that plants do become dewed by their power of radiating heat.*

I cannot, therefore, avoid thinking, that G. I. T. has certainly taken a wrong view of the subject, which is much to be regretted, as I fear from the popularity of the writer, the theory will be apt to mislead the minds of many readers. The only sure path of improvement in Natural Philosophy, is by experimental enquiry, accompanied with close observations of the phenomena of nature.

RURAL AFFAIRS.

Article XI.—EXTRACTS FROM VOLUME II. OF A WORK

Published during the present Year, 1834, *in London, entitled,* "*Sketches in Spain, during the Years* 1826-30-31, *and* 32,

By Captain S. S. Cook, R. N., K. T. S. F. G. S.

Of Newton-Hall, Northumberland."—In Two Volumes.

"The northern side of the high Pyrenees affords a complete example of successive lines or zones of superposed vegetation, which can be traced along the flank of the higher range, by threading the mountains between Bagneres de Bigorre, and Bagneres de Luchon, and the country east and west of these places. In the ascending series, the vine, chesnut, and oak of various species, are succeeded by the beech, the silver fir, and a few of the pinus sylvestris, or Scotch fir; and the highest and most inclement range, *up to the limits of congelation,* and the habitat of Lichens, and other Siberian plants exclusively, by *the Pinus uncinata,* the most interesting tree of these regions."

"In descending on the southern side, the pinus sylvestris is again met with, amongst the uncinata; and considerably lower another species......... In the high vallies, the last trees and shrubs correspond with those of the North of England; and *above them,* where it has not been destroyed, is invariably found the *pinus uncinata.*

"The three species of pine, (P. practinata, P. sylvestris, P. uncinata) some of them of great antiquity, may be seen growing together, the *uncinata* gradually taking the higher place. The upper zone of the chain is formed entirely of the P. uncinata, which is a species hitherto almost unknown, or unattended to, and which is certainly *one of the most valuable trees in the European Flora.* The name was given in consequence of a peculiarly hooked form of the scales (of the cone) which is extremely marked, especially just before maturity. This character has been disputed; but a very little practice and observation will enable any one to pronounce without hesitation, on seeing the different character and colour of the tree from those of its con-

gener, the sylvestris. The cone is rougher, and of a different and more rugged texture than that of the sylvestris, or any other I am acquainted with. An additional proof of the hardiness of the tree is afforded by the early ripening of the cones. I gathered some in the valley of Andorre in July, which were fully formed, at a season when those of southern climates are yet far behind in vegetation. The reason of this admirable arrangement is evident. In these elevated regions the season of vegetation is so short, that the operations of fructification must be proportionally accelerated to ensure their completion: The seed from these cones vegetated; and it is of great importance to be aware of the fact, because the collecting the seed of this species is difficult in many seasons, from the early falling of the snow. The rule I followed, was to select the cones when they had assumed a brown green, and cut dry to the knife. On opening them in this state, the seeds will be found quite formed in the state of a green almond when it is eaten. It is of the last importance that they should not be taken out of the cones, until the planting season, and that they should be kept dry.

"The port and bearing as well as colour of the P. uncinata, are quite different from that of any other species. The form, where the tree is fully developed, is round and massy, frequently resembling that of some of the deciduous trees—the long arm sweeping the ground. The foliage is longer, and much more tangled than that of the Scotch fir; and the green much more intense. It is so dark, that the Spanish woodmen distinguish it by the name of *pino negro*; the two varieties of Sylvestris being called *blanco* and *roxo*. The growth, as far as I could judge, appeared to be about the same, or of rather greater rapidity than that of the Scotch fir. The wood is highly resinous, so much so, that it serves for torches, and it is reputed in the Pyrennees, to be of very great duration. A peculiar quality, which, if it succeed, will make it invaluable in some parts of this country, is that of resisting wind, &c. Whatever be the cause, the wind in the upper regions of the Pyrennees, rages with a violence and constancy unknown elsewhere, even in the Alps, where the same phenomena might be supposed to exist. According to the figurative expressions of the Spanish peasantry, it blows every day in the year. In these inclement regions where I have observed the tree in every form and situation, I never saw an instance where the wind appeared to affect it, nor where it showed a weather side. At the upper limits of its habitat, where it is compelled to yield to the law of nature, and lower its "diminished head," the same rule is observed; and instead of the stunted and starvelling appearance of the rest of the tribe on

similar situations, it assumes the shape of a furze bush, presenting an impenetrable and bristling front of dark spiculæ on every side, the stem or branches being quite undiscoverable. This is the species to which the name PYRENACCA *ought* to have been given, it being as far as observations have been yet made, peculiar to that chain. It may be expected to form a valuable addition to our forest trees, and it is singular that it should have been hitherto nearly unnoticed. It is mentioned in Sweet's Catalogue, as introduced in 1820. But *in the Botanical Garden at Glasnevin,* near Dublin, there is an individual of much longer standing.* I have not seen that tree since I visited the Pyrennees, but I have little doubt, from the recollection of it, that it is the right sort. I could obtain no certain information of its history; most probably it came from Paris.

* I took the earliest opportunity, after reading the foregoing passages, to search for this tree in the Glasnevin Garden, and with the assistance of the curator, Mr. Niven, found it without the least difficulty, for it bore a conspicuous label, with the name inscribed. It abounded with cones, some of which had already opened and shed their seeds, but others were close and compact; and on taking home with me a pocket full, I found the seeds apparently in a sound and perfect state, and have since committed them to the earth. The cones are somewhat larger than those of the Scotch fir, but of a very different aspect when seen in the hand; so that after one attentive examination they can never be again mistaken. The shape and arrangement of the scales is peculiarly elegant, and the *uncus*, formed by the folding back of the upper part of the scale very conspicuous. The bark of the tree is remarkably thick and rugged; the lower branches very heavy, and showing a disposition to extend, as described by Captain Cook, if space were afforded. But this tree, like many others in the garden, stands in a crowded compartment. The character of its resisting the wind, and not showing a weather side, does not however hold good, as the tree has a decided inclination from the west, that point, whence, from the time of Giraldus Cambrensis, all our trees in every part of the island have been observed to flinch, if exposed to the blast. The specimen appears to be coeval with the formation of the garden, and no doubt was procured through the energy of its projector and virtual founder, the late Lord Oriel, then the Right Hon. John Foster.

ARTICLE XII.

ESSAY ON THE CULTIVATION OF WASTE LAND,

For which the Prize was awarded by the Agricultural Society of Liverpool, to

MR. REED, PROFESSIONAL DRAINER, &c.

(Extracted from the Irish Farmer's and Gardener's Magazine.)

"PERHAPS there are few objects on which money has been expended more injudiciously, or in the pursuit of which more disappointment has occurred, than in the attempts to drain moss. The great stumbling block in the road to success, seems to have been the want of duly considering *the principle* by which the water is retained in mosses. In many instances much labour has been thrown away in endeavouring to cut deep and wide drains, at a considerable expence, under the impression that they would produce every desirable effect over a large extent of surface. But, if what has been advanced, namely, that 'the water to a considerable depth from the surface is held in a great degree by capillary attraction,' be correct, it follows, necessarily, that the only way to get rid of the water is to destroy the principle by which it is held, and this can only be done by *piercing the moss to a considerable depth, at such distances as will set the water at liberty between any two incisions.* In all cases where the soil to be drained is of an uniform character, and somewhat porous, the distance to which any drain will have a beneficial effect is in proportion to its depth. Breadth in a drain only increases its capability of conveying water away *after it has received it,* but does not augment its power to dry the land. As a matter of course, the width of a drain at the top must be determined not only by the depth which it has to be sunk, but due regard must also be paid to the inclination at which the earth on the sides *will stand,* and preserve the required form. But without saying it is absolutely impossible, it may safely be asserted that it is very unprofitable, to attempt even to cut deep drains on white or flow moss. The semi-fluid character of this substance, in consequence of the quantity of water held in the multitude of capillary tubes, of which the vegetable mass is composed, causes a pressure upon the sides of any and every drain that is cut and the pressure will be as is the depth. The water, in fact, seeks to find the lower level which has been created by the drain, but it is held in the moss by capillary attraction; a sort of conflict then ensues between the two principles, which in all cases where the drain is made of an improper depth, ends in the water taking the moss along with

it, as it were, and the two sides of the drain come together. Both principle and practice have taught and confirmed the writer in the opinion, that the only effectual way of draining deep moss is by inserting drains at small distances from each other, and that in order to effectually drain, and at the same time, to keep the expenditure within a proper compass, it is necessary to make the drains of as great a depth as the moss will conveniently allow, without removing more of the moss than is absolutely necessary. For, of course, the expence of a drain will be in proportion to the quantity, weight, &c., of the stuff removed by the workman.

"The late venerable Mr. Roscoe, who may with truth be styled the pioneer of moss improvements in the county of Lancaster, seems to have been of the same opinion in the early part of his labour to improve Chat Moss, though it appears that he afterwards ceased to act upon it, assigning as a reason that the process was 'too tedious and too expensive' He then 'made drains four feet wide at the top, and one foot at the bottom, and four feet and a half deep.' These drains were fifty yards apart, and Mr. Roscoe, in his account of the improvements of Chat Moss, which is printed in '*Steele's History of Peat Moss*,' says, that he believes 'that they will sufficiently drain the moss without having recourse to under-draining.' In another part of the account, Mr. R. expresses an opinion that the time necessary to effect the desired degree of dryness and solidity in the moss, will be in the same proportion as is the distance of the drains one from the other. But the truth of the matter is this, that the tract of the moss so attempted to be drained by Mr. Roscoe, twenty years after these same drains were cut, was in no instance, even where the drains had received several subsequent sinkings and cleanings, possessed of the necessary degree of dryness; and in other parts, where this after-attention had not been paid, the drains were so squeezed together by the lateral pressure, that they were with much difficulty traced at all. Mr. Roscoe, was, no doubt, strengthened in his opinon as to the inutility of under-draining by the confirmation it received from the writings of, and, perhaps, personal communications with, Mr. William Aiton, of Strathaven. This latter gentlemen, to whom the agricultural world is indebted for his '*Essay on Peat Moss*,' and other works on rural economy, has expressed an opinion that, under-land draining is 'not necessary, and can do no good.' Notwithstanding the weight which the opinions of such gentleman necessarily and properly carry with them, the writer begs to be allowed to differ. He cannot believe that the quickest way of draining a moss ought to be abandoned on the plea of its be-

ing 'too tedious,' and as to its being 'too expensive,' that may be a reason for leaving it undone altogether; but surely, if it is worth while to drain such surfaces at all, it is most consistent with good economy to drain them in an effectual manner. In mentioning the name of a gentleman of such superior attainments as Mr. Roscoe, and in thus subjecting his patriotic endeavours to improve the morasses of his native county to criticism, the writer hopes that he shall not run even the hazard of a charge of wishing to speak dispraisingly of an individual towards whose memory he feels the most profound respect, and to whose labours he has been, and shall ever feel and own himself, deeply indebted. For it is not alone from the successful experimenter that individuals or the public derive information; on the contrary, the want of success, while it inflicts loss and disappointment on the person immediately concerned, operates as a cheap, and unbought instruction to others, and as the more minute causes of failure develop themselves, they serve as so many beacons, even as the wreck of the vessel of the first navigator of unknown seas, *marks the spot of danger*, and enables those who come after, to make in safety the desired haven:

"Assuming, what in fact may be assumed with great safety in almost every case, that the level of the land by which the moss is surrounded, affords sufficient fall for its drainage, the first thing to be considered is the most convenient situation for, and the direction of, the roads by which the intended fields are to be approached. On each side of these roads a drain will be necessary, and the divisional drainers of the fields should be placed, as nearly as possible, at right angles with the line of road. It is desirable that the drills, butts, or ridges, which may hereafter be formed on the surface, should lie as nearly north and south as possible, and consequently, if no other circumstance interferes to prevent it, the divisional drains of the fields should be placed in that direction also. It would be difficult to anticipate the particular circumstances which even in any one case will have to be considered before the general plan of laying out a moss for cultivation is fixed upon, much less is it possible to make a rule which shall be applicable to all cases; but it may be safely recommended, that *all improvement on particular parts of mosses, should be subservient to some general plan of improvement, either of the whole moss, or of such part of it as belongs to the same proprietor.* What is meant to be included here under the term '*general plan*' is, the direction of the roads, of the divisional drains of the fields, and the form, as well as length and breadth of the fields. The open drains, which serve at once to divide the fields, to assist in draining the moss,

and to receive the water from the under-land, or as they are termed in Lancashire, *hollow* drains, may be placed at any distance not exceeding one hundred yards apart. It is desirable to have them as far apart as possible, on account of the operations of cross-ploughing, harrowing, &c., which is sometimes necessary in such land, and which is greatly impeded when the horse or horses have to turn so very often; on the other hand, it must be kept in view, that the drainage is the first and most important step to improvement, and that all other matters must conform thereto. The hollow drains should run at right angles to the line of the open or divisional drains; it follows therefore, that they will be of precisely the same length as is the distance between any two open drains, and, as the chances of stoppage in the hollow drains are in proportion to their length, it is most prudent, especially in the early part of the improving process, to let them be as short, and, consequently, the fields as narrow, as is consistent with the convenient carrying on of the other operations. After having tried all distances between fifty and a hundred yards, the writer has fixed upon sixty-six yards, or three statute chains, as the best width of the fields. By having the fields either so many chains, or so many perches wide, a considerable facility is afforded in estimating or measuring the quantity of work done by the workmen employed in the after-cultivation: for instance, where the perch of seven yards is in use, the fields might be made seventy yards wide, and then, in any case where mowing, shearing, &c., has to be measured, sixteen perches in length of the field would be an acre; in like manner, where the perch consists of eight yards, the width of the fields might be made sixty-four yards, and twenty perches in length of the field would be an acre.* The open drains should be set out four feet wide at the top, and, when finished, they should be from three feet six inches to four feet deep, and about fourteen inches wide at the bottom. To get them down to this depth, and still to preserve their form, is a work of time; the operations of the improver must be governed by the degree of fluidity possessed by the moss; in proportion as this is great, so must the operations be slow, but there is scarcely any conceivable degree of wetness which may not be overcome by judicious treatment. The practical operation by which these drains are made, are as follows: the direction of the drain having been determined, the workman stretches a line to

* Although the writer mentions these figures, he hopes to live to see the day when there will be but one standard measure for an acre througout the kingdom, as well as for the produce of the soil. The multiplication of terms expressive of quantity is productive of much inconvenience, to say the least of it, and is not unfrequently made use of by the designing to deceive the unwary.

guide him in cutting one side with a tool called a 'Tommy spade.' —This spade is heart-shaped, and quite flat, that is, not dished, having the two somewhat circular edges as sharp as a scythe, or nearly so; the shaft is about twenty-four inches long, straight, and has a strong cross-handle at the top, about eighteen inches long. The workman cuts one side of the intended drain to about a foot deep, much in the same way, though, of course, with a different position and motion of the body, arising from the difference in the form of the tool, as a person would cut hay from the stack. Having made this cut to as great a length as is convenient, the line is shifted four feet, and the other side is cut. The intervening space is then divided into pieces of about a foot square, (with the same tool,) which are thrown out by the workman, who, as soon as he has made room for himself, standing in the drain, supported by pieces of wood fastened to his feet, technically called pattens. If the moss is found sufficiently dry, another sinking of a foot is immediately had, and, on one side of the bottom a still further narrow deepening, in the shape of a wedge, is made, which while it increases the power of the drain, is more dry and easy to take out at some future period. Whether the two sinkings, or, as they are called among Lancashire moss workmen, *draws*, can be effected, must be left to the state of the moss and the judgment, of the improver; but in almost any case this is the extent that should be attempted at once, and the drain may be completed when the moss shall have attained sufficient solidity; to increase which, the hollow drains should be commenced: these should be three feet deep, and be increased at every five or six yards. A lapse of time between the operations for forming them is equally necessary, as in the case of the open drains. No foreign material is required, such as wood, tiles, or stone, the moss itself is the best, as well as the cheapest covering. The form should combine the principle both of the shoulder and the wedge drain, and the somewhat square clod which is first taken out, when dried to a certain extent by the weather, becomes the cover. The writer fears that no description which he could give as to the mode of forming these drains, would be sufficiently plain and instructive to enable others, without seeing them, to make a correct judgment either as to the propriety of the form, or the economy with which they are executed; should, however, the approbation of the Liverpool Agricultural Society cause this paper to become public, the author will be most happy in personally showing and explaining to its members, or any other gentleman who may feel interested in the subject, both the drains and the manner of executing them. The inclination at which the water will have to de-

scend, even at the line of greatest difficulty, namely, the midway between any two drains, is, if the drains be six yards apart, as three to one; and if they are five yards apart, it will only be as two and a half to one. This, it is believed, will be admitted, is a system of drainage at once simple and powerful, and when it is stated, from somewhat extensive experience, that its cost does not, under ordinary circumstances, exceed forty shillings per statute acre, it will not, it is hoped, be rejected on the score of being too expensive.

MISCELLANEOUS INTELLIGENCE.

I.—QUERIES, ANSWERS, REMARKS, &c.

A Word on the Animadversions of the Editor of the Gardeners' Magazine.—The Editor of the *Gardener's Magazine*, in reviewing our *Magazine of Botany*, Vol. 10, p. 230, has made assertions which we feel bound to notice, not with a view of affording any explanation to that gentleman, but merely because the paragraph may have fallen in the way of some of our readers.

Passing over the greater part of the Editor's scurrilous remarks, as being beneath our notice, we feel happy in being able to say, that "the Cotton-printers, Porcelain-manufacturers, and Paper-makers" of our country, to whom Mr. Louden contemptuously recommends the perusual of our work, (and who by the way are not a despicable class of persons) are in so flourishing a condition as to purchase, every month, betwixt two and three thousand numbers of our Magazine of Botany.

One grievous charge urged against us is, that for the *Horticultural Register*, we occasionally extract articles from the Gardener's Magazine, and that we have on two or three occasions copied woodcuts to illustrate the same!! We plead guilty to the charge, but could never dream that in so doing we were sinning so grievously as this Editor would persuade his readers. For although the Horticultural Register has been in circulation something more than three years, this offence is just now, for the first time, pointed out to us.

As a proof that we have not deviated from our original intention, we submit the following extract from our introduction, Vol. 1, p. 3.

"We shall not only present to the readers of the Horticultural Register, valuable original communications from our friends, but we

shall also *make extracts of every thing* that *we judge* will *promote* our *ultimate object*: and such extracts will not merely be confined to present publications; for where any thing of a decidedly useful character is found, and such having been very limited in its circulation, we shall avail ourselves of the opportunity of giving it insertion in our pages. In so doing, it will be our endeavour to condense every article into as small a space as is practicable, consistent with the true meaning. Our object in doing this, is to be able to give as much information in our little work, as the limits of its pages will allow."

Now, we appeal to our readers, whether we have not endeavoured to act agreeable to this our first promise. In making such extracts, we do no more than common justice to our readers, and no objections can be urged against the practice, in reference to our Register, which would not equally apply to every other periodical. As well might one newspaper be prohibited from copying from another any thing that is interesting, in the hope of compelling the reader of news to purchase a score of newspapers, for the purpose of gaining any thing like a correct notion of what is going on in the world.

The Horticultural Register, and other similar miscellaneous periodicals differ materially from works written expressly on one subject. We are aware that nothing can be more unjust than that a work, over which another has spent many years of labour, should immediately on its appearance be mutilated for insertion in large Encyclopædias, or be wholly abridged for publication in another work. For an instance of this latter system, we need only refer the editor to the work entitled "The Different Methods of Cultivating the Pine Apple in Great Britain," by ——— (which looks hard at Porchester Terrace,) wherein are several treatises which cost their respective authors many years of toil and experience, and which are copied nearly verbatim.

Of all literary characters, Mr. Loudon should be the last to complain of copying, for no writer, in the present day, has derived so much benefit as himself from the honest labours of others. We admit, that he has effected some *Original Improvements,* as he is pleased to call them, (Original Nonsense would, we think, be a far more appropriate epithet,) and, but for the dread of making our Register the vehicle of such brain-fever nonsense, we should have offered an *extract* or two from a work of his, which he terms, "A Short Treatise on several Improvements recently made in Hothouses.' Here the Author's *original* garden abilities are discovered; and here the highly favoured few, who are in possession of this *valuable* "Treatise," may see how readily he would have set the *Thames* on

fire, had his public influence been equal to his *astonishing Horticultural abilities!!!* It is unfortunate for him, that the gardeners of the 19th century have so little penetration, and possess such a degree of apathy, that the Treatise has scarcely attracted their notice, for any other purpose than to laugh at its contents. In no single instance throughout our travels, have we met with a hot-house erected on Mr. Loudon's *improved* principle.

Not being in the habit of exciting the risible faculties of our readers, we forbear giving an engraving, being indisposed to put them to any extra expense to stay the dangerous symptoms of excessive laughter. We content ourselves by merely stating, that the improvement consists in having a large pair of *Blacksmiths Bellows* fixed in the back wall, to nourish the plants with occasional blasts of fresh air.

But to return to the charges brought against us,—Mr. Loudon says, that our Magazine of Botany contains "more plagiarisms than the Horticultural Register." We suspect by this he means, that in our details of culture we resemble other works, on the same subjects. Our readers need not be told, that where the authors are practical men, a resemblance cannot be avoided, unless success be put out of the question.

To prove the truth of his assertions, the readers of the Gardener's Magazine are referred to the wood cuts given in our Magazine of Botany, pages 12, 23, 24, 36, and 47, which the Editor very gravely assures his readers are either fac-similes of cuts first given in the Gardener's Magazine or very trifling variations from them, taken without the slightest acknowledgement.

The first, on p. 12, is a figure of the mode of packing Auriculas in a box, to send to a distance, given in the Horticultural Register, Vol. 2, page 403. Now we thought, when the Editor gave a figure very dissimilar to ours, even in the mode of packing, in the Gardener's Magazine, Vol. 7, page 717, that the practice having been followed by florists for probably half a century, we had no cause, as practical men, to refer to his work to learn how to pack Auriculas.

The figure of Seibes Improved Syringe page 23, of our Magazine of Botany, we copied from the Gardener's Magazine, and acknowleged doing so, (see Horticultural Register Vol. 1, page 710,) for we had not, at that time, an opportunity of seeing one; but this syringe having since been circulated through so many gardens, we thought it quite unnecessary to prepare another figure from a real syringe, when we already possessed the wood cut previously inserted.

The detached fumigator, Mag. Bot., page 24, and Horticultural

Register, Vol. 1, page 805, was first used by us when a boy, and therefore merits no notice as an original invention; we noticed it in our Horticultural Register as being manufactured at Messrs. Warner's, and sold to the trade at a moderate price. This notice of it we gathered from the Gardener's Magazine, see our acknowledgement, Vol. 1, page 805.

In page 36, Mag. Bot. are two figures on propagating Camellias; on these we shall merely remark that they were cut for the purpose, from original drawings, and that there are no figures of the kind given in the Gardener's Magazine.

In page 47, Mag. Bot., and Hort. Reg., Vol. 1, page 760, is the figure and description of Jesse's mode of planting large trees. Now this figure could not possibly be a fac-simile of the one in the Gardener's Magazine, for no such figure appeared in the latter work until two months after we had inserted it in ours. It appeared in our number for October 1832, and in Mr. Loudon's number for the following December. See Gard. Mag. Vol 8, page 732. Now with this plain fact before him, which no person could easily overlook, this Editor publicly assures his readers, that we copied the figure from his work!!

Whilst on this subject, it may be well to remind this Editor of another *little* mistake made by him awhile ago. Possibly he may not have forgotten, that we inserted an annular pan in Vol. 1, page 151. of our Hort. Reg. which was named "The Bygrave Plant Preserver." This identical pan (modified, of course, to pass for an original article) appeared in the Gard. Mag. three months afterwards with *Cond.* at the end of it. We need scarcely say, that nothing like this has ever occurred in reference to our work. And when we have omitted the acknowledgement of any article, it has been an inadvertency, for which we publicly apologized in our preface to the second Volume of the Register.

We have now given about 400 figures, and there are but very few instances in which we have either directly or indirectly borrowed any from the Gardener's Magazine. The articles placed under the head "Original Communications," page 165-70, bear evident marks of mistake on the face of them, each being acknowledged as copied from the Gardener's Magazine. The mistake originated with the printer, and was not noticed by us until too late in the month to be remedied.

But enough for the present, and perhaps it is only a waste of time and space to notice the subject at all, for whoever refers to the article in question will at once perceive the jealous, vindictive spirit in which it is written.

STRIPED HOUSAINEE MELON.—How am I to know when this kind of melon is ripe?

NEW SORT OF MELON CALLED WILLIAM THE 4TH. ENQUIRED ABOUT.—Pray have you seen the new variety of Melon called William the Fourth? It is a small fruit, round in shape, having a very pale skin, white flesh, but extremely luscious, and sweet; indeed, surpassing all others I have yet seen.

GIANT ASPARAGUS ENQUIRED AFTER.—When can I procure a little seed of the *real Giant* Asparagus? Do you think that by the cutting of all the heads of grass except one from each root, and allowing only that one to run to seed, will be a means of strengthening it?

WATSON'S HYBRID RHUBARB? Pray will Watson's Hybrid Rhubarb come from seed or not?

SCHIZANTHUS HOOKERI.—Is there any particular treatment for the Schizanthus Hookeri. I have several friends who have lost many hundreds. A hint on this subject would be particularly useful.

July, 1834. H. G. C.

RAISING SALLAD.—Perhaps you will oblige me by setting a little matter at rest which has created a world of words, and which in my humble opinion is insufficient to satisfy my clamorous friends, or I should have said credulous friends. It was lately asserted in a Daily Paper, that a Gardener in Chelsea, had laid a wager with another Gardener, that he would raise a sallad within two hours.—Your opinion will suffice as to its practicability or impracticability, should you think it a question worth your consideration. And perhaps you will state your opinion as to the shortest period, in which a salad can be raised. Would you deem a Paper worth insertion in your *Register* on the Management of the Water Cress, and which method has met with the most decided success? A LONGSTONE LAD.

BINFIELD FRUIT GARDEN.—I should be obliged, if you would give the plan of the Binfield Fruit Garden, mentioned Volume 2nd, and likewise the method of laying out a garden for the culture of vegetables?

CULTURE OF THE PEAR.—Will you pray give a continuance of the Article on the Culture of the Pear, as promised in Vol 2, page.

G. B.

CULTURE of the Plumeria rubra wanted? Would you inform me the best method of cultivating the Plumeria rubra, as it neither thrives nor flowers with me? So doing, you will greatly oblige.

Pruning Nut Trees.—Can any of your readers give a detailed account of the best method of pruning Nut-trees? In Kent, they manage to make their trees very productive.—What is their management of them? X. X.

Preparation for Destroying Insects wanted.—I should be glad, if you or any of your readers could give me information respecting the preparation made by West and Co., called Chalcidica, for the destruction and prevention of slugs, grubs, and all kinds of insects on corn, vegetables, walls, fruit-trees &c. &c., as probably you, or some of your readers or correspondents may have given it a trial. If so, I should be most happy to see their opinion of it in the *Horticultural Register*. An Enquirer.

Which is the best mode of applying the Pollen of Carnations? Will you, or some of your Correspondents, inform me the best way to apply the Pollen of the Carnation to the Pistil? I want to know if it is to be applied to the very tip of the horn, and what is exactly the proper time;—also the names of a few of the best sorts of Carnations and Picotees that perfect their stamens: and lastly what advantage is obtained by leaving part of the shoot, between the tongue of the layer and the main branch, out of the ground, as I have often seen, and heard recommended, but could never get any explanation. H. C.

On the Housainee Melon. Proposed to the Author of the Domestic Gardener's Manual.—Permit me, through your excellent Journal, to submit a few queries to your scientific Correspondent G. I. T., who has so kindly and liberally offered his assistance on a subject which interests me much. On the 23d April, I removed three Housainee (striped) Melon Plants from the pots in which they were raised, planting them in three separate lights, built with brick and Pigeon Holes, each light six feet by four, from the floor to the Glass is three feet eight inches. They were planted at the back in a bed of loam, and a small quantity of dung, eighteen inches deep, and trained upright about twelve inches only, being all I could spare and when trained downwards on a trellis fourteen inches from the Glass. Two of them were thus treated, and the third trained as melons usually are; they all grew very strong, and only one fruit set in the first light, and two in the second. The plant trained on the ground had five fruit, four of which I allowed to remain. The fruit at first was a deep green, shewing gradually a lighter green stripe, and becoming beautifully netted. On the 23d June, the one in the first light cracked longitudinally quite to the seed, and in two days after the two in the second did the same, as

also did one of those trained on the ground. I cut three of them, placing them in a vinery, where they turned rather yellow. They were very sweet, and higher flavoured than any other melon I have ever tasted, though rather watery. Each fruit weighed three and a-half pound. All the plants are very healthy, and perfectly free from insects of any kinds. If G. I. T. would have the goodness to give me any information, and point out my error, I should feel much obliged, being convinced that I have not tasted the fruit in perfection. M. D.

HOW SHALL I DESTROY MOSS ON LAWNS? I shall esteem it a favour, if you will inform me, what is best to be done to kill moss on Lawns or Pleasure Grounds, as well as on gravel walks? I have tried salting, liming, and turning over for the walks; these things will do for a time, but in the course of a few weeks the state of things is as bad as ever. The moss, or, as some call it, the fog, has entirely destroyed the grass. I sometimes think of digging it all down, and sowing it again. Unless you can inform me of something that will extirpate it, I shall be obliged to have recourse to the digging. I do not know whether it is owing to the mowing machine having done away with the scythes. G. E. J.

P. S. What is the best sort of Rhubarb for general use? Ans. Wilmots and the Gigantic, particularly the first.

ARE DECAYING GOOSEBERRY CUTTINGS INJURIOUS TO YOUNG HOLLIES? I planted a holly hedge about three years ago, which was entirely destroyed by the hares and rabbits; this was for a fence round a wood. About a year and a quarter since, I replanted it, and strewed lightly over the plants some gooseberry cuttings, for the purpose of protecting them, which I have hitherto found very serviceable. But I am informed by many persons, that there is something in the Cuttings of a poisonous nature, which will destroy the hollies or any other plants near them. Having my doubts on the subject from actual observation, it occurred to me that you would favour me through the *Register*, with an opinion on the subject.—Some of the cuttings have now begun to decay, and it has been a matter of consideration whether they are injurious when beginning to decay, If so, should the decayed branches be removed, and be supplied by new cuttings, or the old ones be allowed to remain, and merely supply the defects? T. BUTLER.

A LARGE SILVER MEDAL OFFERED TO ANY PERSON WHO POSSESSES THE BEST SICEUS.—The Warwickshire Floral and Horticultural Society will award its large Silver Medal, of the value of two sovereigns, to the most complete Hortus Siceus, to be exhibited at the

last show of the Society, which will be held next November. All specimens to be addressed (Carriage Paid) to the Secretaries. And in due course the same will be carefully returned.

H. KENDALL, TREASURER.

COVERING FOR GREENHOUSES AND FRAMES.—The Author of the Domestic Gardener's Manual having, in a paper on Greenhouses, inserted in the last Quarterly Agricultural Magazine, recommended a Temporary Covering of *Oiled Canvass* to be placed over Greenhouses at night, and wishing to use something of the sort for Frames containing plants in the winter, I doubt not, from the readiness with which he endeavours to improve your readers, that he will oblige me, through your pages, by giving the necessary instructions for preparing the canvass for use. H. C.

CHANGING SEED CORN.—G. M. W. is informed, that the changing of Seed Corn is very requisite, if judiciously considered, the higher land lies above the level of the Sea, the soil is not so fertile nor the climate so genial as low grounds; therefore if a clean sample of any grain can be obtained from high land, and sown on soil that lies lower, the grain will increase in quality and size for three or four years on that Farm. When the grain is observed to decrease, which it will do after the soil can improve it no further, another change as above should take place.— WILLIAM GREY.

To an enquirer, page 288, relative to the culture of AQUATICS. Changing the water of Aquatics must depend on the situations in which they grow; if in pots placed in pans of water, they should be supplied twice or three times a week in summer, and once a week in winter. The best kind of soil for them is composed of bog earth (not peat) and loam, with a large portion of sand. The times of repotting depends on the sorts and state of growth, once in a year for the generality of plants, is sufficient, and in some cases not oftener than two years. This should be done immediately after the flowering season. On no account pare the balls of roots with a Knife.

ANAGALLIS WEBBIANA. This plant never thrives if it be crowded amongst other plants. It is always better to strike young plants every year, the old ones seldom thrive well more than a year. Cuttings taken off at three joints, and planted round the sides of a pot, and plunged in a gentle heat, will strike roots readily.

CHRYSANTHEMUMS. If the roots of Chrysanthemums are allowed to grow through the bottoms of the pots, they will when cut off, greatly check the growth and flowering of the plants; this may possibly have been the case with those named, page 288, if so, the best plan is for the future to shift them into larger pots so often as they require it, and not to allow them to stand too long in one place without being moved.

REVIEWS.

Article XIII.—A BOTANICAL CHART, OR CONCISE INTRODUCTION TO THE LINNÆAN SYSTEM OF BOTANY.

BY JAMES RATTRAY, SURGEON, AND LECTURER ON BOTANY, GLASGOW.

Cloth, 4*s*. 6*d*.

This little chart consists of two large folding sheets, containing all the rudiments of the sexual system of botany. The lesser of these sheets, (1 foot long, and ten inches broad,) consists of copper-plate engravings, of roots, leaves, flowers, fruits, &c. &c. illustrative of the science. The other (2 feet by 20 inches) contains the letter-press. This is divided into six columns; the two first enumerate the various parts of a plant, and under the proper heads are given the terms applied to the different forms of these parts, with concise explanations or definitions, illustrated by engraved figures on the other sheet, and to which reference is made by numbers. The other four columns give a connected view of the Linnæan system. The first contains the names of the classes, with a short character of each, and a figure in illustration. The next column contains the orders, with cuts illustrative of their characters. In the third column the genera are arranged according to their orders, with their most common English names. The last column contains a complete list of all the species of the Phenogamous plants, and of the Filices and Musci in Cryptogamia, with the duration, time of flowering, soil, and situation of each. The names of the genera in the Orders Algæ and Fungi, follow with such a number of the species as could be embraced in the sheet, thus forming a very complete catalogue of all the indigenous plants of Great Britain. The whole is so folded that the book is but ¾ of an inch thick, 4 inches broad, and little more then 9 inches long. And we think it well deserving of every recommendation.

Article XIV.—ADAM THE GARDENER.

BY CHARLES COWDEN CLARKE.

Author of Tales in Prose, from Chaucer, 12*mo. London.*

This pleasant little work is written in an attractive style, well calculated to beget, in the minds of youth, a love for nature and the cultivation of a garden. The methods of culture detailed in it, although not intended for the Practical Man, are nevertheless very good, and in reading it we found many things peculiarly interesting and instructive.

ARTICLE XV.

COLLECTIONS AND RECOLLECTIONS.

NIGHTINGALE.—In the notices of the migratory songsters, in your Magazine for April, 1834, it is there stated that the Nightingale is seldom heard before the 16th or 17th of that month. I thought it would not be uninteresting to some of your readers, who are pursuing the study of natural history, to be informed that the Nightingale was heard near Ryde, Isle of Wight, on the evenings of the 10th and 11th of March. As I was going through a wood, on the afternoon of the 10th, I was surprised by its soft, low whistle, and on returning to the spot, about seven o'clock in the evening, I had the pleasure of hearing its beautiful notes, full a month earlier than I had ever noticed them before. A friend to whom I stated the circumstance, said he had heard her the same evening, though in another spot; he heard her again on the next evening; but since then we have not been greeted with her melodious song, owing to the coldness of the weather. B. B.

IMPROVED GARDEN CHAIR—*By Mr. Saul.*—I have sent you the present drawing of my improved chair, fig. 27, which differs materially from the one you gave before in Volume 2, page 462; and in the Magazine of Botany, page 123. The seat is supported by the pattern of a vine branch, which gives it a very pleasing effect on a lawn.

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ADVANTAGE OF SOOT used to the stems of Cauliflower plants.—In the year 1829, my Cauliflowers appeared to be all going off, in the month of May. Finding the injury arose from the grub at their roots, I resolved to try the effects of soot. I put a quantity round the stem of each, watered them well, and afterwards earthed them up, and immediately the plants began to recover, and grew rapidly, making at the proper season very fine heads. On examination, I found

that they had made fresh roots into the soot, above the part affected by the grub, which never appeared to have penetrated the stem further than the part below where the soot was laid. This material I have found beneficial to all the brassica tribe, on land where the plants are subject to grub. W. MATHERS.

METHOD OF FLOWERING HYDRANGEAS BLUE.—In the month of July, 1833, I took the plants out of the pots, shortened their roots, and shook the soil from them; after which, I repotted them in pots, which held four quarts of soil each, and, adding four ounces of pounded alum to each pot of soil, mixed them well together. In the spring of 1834, the plants began to show their flower-buds, which were tinged with a fine light but rich blue colour; the plants grew very fine, and flowered to very great perfection: they were kept in the greenhouse the whole of the winter and spring, indeed, until they had done flowering. The soil was a light sandy loam.

W. MATHERS.

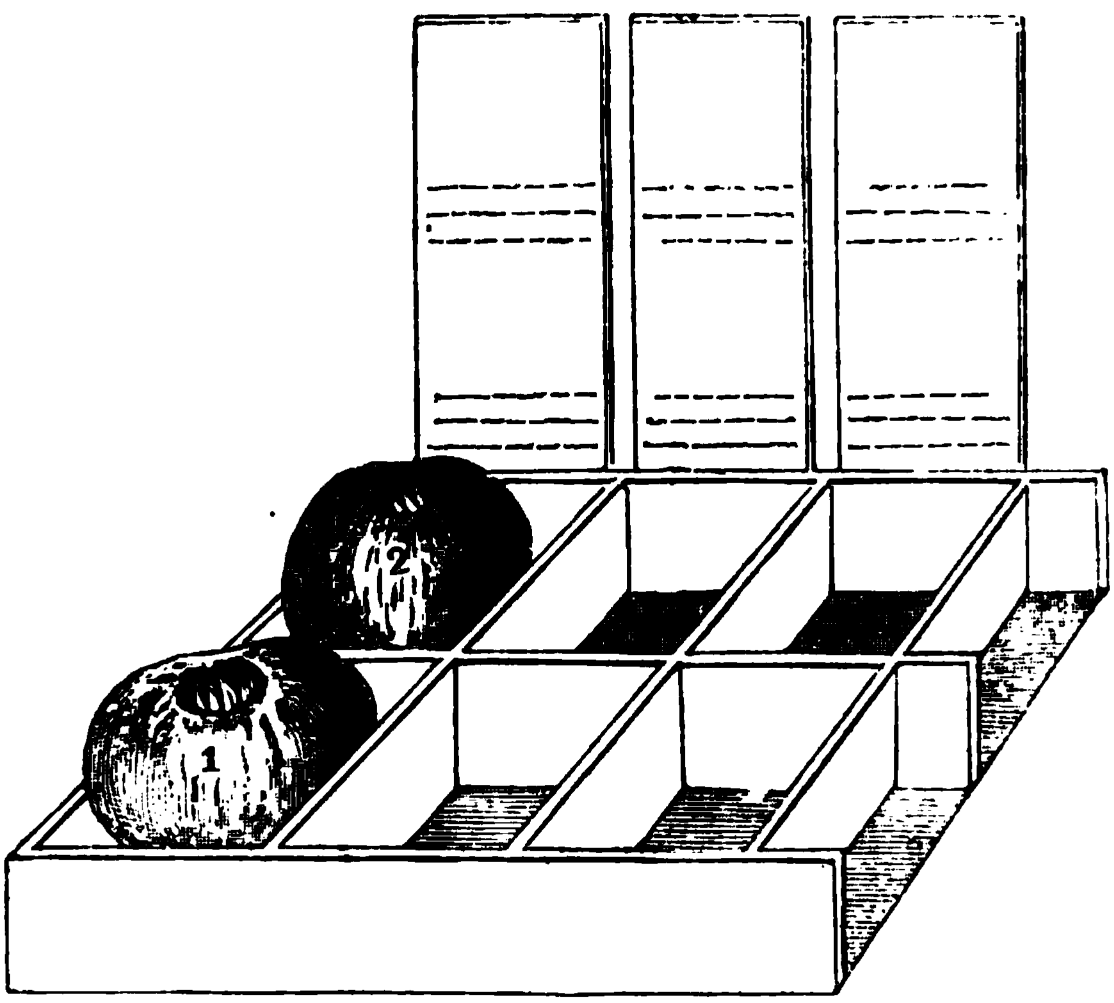
ON THE RETARDING OF THE RIPENING OF FRUIT.—Numerous and various as are the methods in daily practice to obtain the best kinds of fruit earlier than their natural season, yet it seldom happens that much pains is taken to retard them in perfection beyond their usual time of duration, though this would be frequently desirable, and of easy attainment. This subject is, at the present time, brought to my mind by reading the following passage in Lyson's Environ's of London. The insertion of it in your journal may, I hope, lead some of your correspondents to make known methods of keeping fruit long in perfection. J. T.

Lyson, in his account of the Environs of London, has, in his description of Beddington House, Surrey, Vol. 1, page 58, formerly the seat of the noble family of Carew, the following passage: "Sir Hugh Platt tells an anecdote in his garden of Eden, relating to one of the visits of Queen Elizabeth to Beddington; which shows the pains Sir Francis Carew, took in the management and cultivation of his fruit-trees. Here I will conclude, (says Platt) with a conceit of that delicate Knight, Sir Francis Carew, who, for the better accomplishment of his royal entertainment of our late Queen Elizabeth, of happy memory, at his house at Beddington, led her majesty to a cherry-tree, whose fruit he had for the purpose kept back from ripening, at least one month after all cherries had taken their farewell of England: This secret he performed by straining a tent, or cover of canvass, over the whole tree, and wetting the same with a scoop or horn, as the heat of the weather required; and so, by withholding the sun-beams from reflecting on the berries, they grew both great

and were very long before they had gotten their cherry-colour: and when he was assured of her majesty's coming, he removed the tent, and a few sunny days brought them to their full maturity."

Figure of a Fruit Stand, by Mr. Saul.—Fig. 28, Each division is made to hold one fruit; a card is fixed on the back of the stand by means of a tape nailed lengthwise at the back. Each card contains the descriptions of the two fruit opposite to it, with a short notice of the qualities, origin, &c. The full size of the cards, is four inches long, and two broad.

28



Large Cockscomb.—(Celosia cristata.)—Not having seen any accounts of large Coxcombs, during the past twelve months, I herewith send you the dimensions of one I grew last year of the tall sort. The height of the plant to the bottom of the flower from the surface of the mould, two feet six inches, height of flower sixteen inches, total height three feet ten inches, length of flower over the crown, from one point to the other, two feet, and one foot ten inches across; and if the flower had been laid upon a board, and each convolution of the flower straight along, it would have measured upwards of forty four feet and one half. The compost, in which it grew was maiden loam, rather sandy, and the old dung of a mushroom bed, rather more than one half. I had several more, none of which measured below seventeen inches, and one in particular, of the dwarf sort, 18

inches high from the mould, had six flowers. None of them was below eight by four; the largest was sixteen by eleven inches. I have some of the flowers retaining the colours as bright as they were on the day they were cut, although not so large. G. E. I.

P. S. What is the best Rhubarb for general use?

CAUSE OF COOLNESS BY THE USE OF FANS.—To explain the apparent contradiction implied in the fact, that the use of a fan produces a sensation of coolness, even though the air which it agitates is not in any degree, altered in temperature, it is necessary to consider that the air which surrounds us is generally at a lower temperature than that of the body. If the air be calm and still, the particles which are in immediate contact with the skin acquire the temperature of the skin itself, and having a sort of molecular attraction, they adhere to the skin in the same manner as particles of air are found to adhere to the surface of glass in philosophical experiments. Thus sticking to the skin, they form a sort of warm covering for it, and speedily acquire its temperature. The fan, however, by the agitation which it produces, continually expels the particles thus in contact with the skin, and brings new particles into that situation. Each particle of air, as it strikes the skin, takes heat from it by contact, and, being driven off, carries that heat with it, thus producing a constant sensation of refreshing coolness.—*Lard. Cab. Ency.*

OXALIS CRENATA.—The roots of the Oxalis Crenata roasted as Chesnuts, and the *stalks* used for tarts like Rhubarb, are both said to be superior in flavour; whether the *leaves* also were tried is not known. This is merely a hint to direct the Editor's attention to these trials, related on good authority to the writer.

Since we received this notice, we have made a tart of the stalks, and found it to be very delicious, far superior to Rhubarb, probably coming nearest in flavour to a very fine Apple. We have not yet had the opportunity of roasting the roots, but have little doubt of their being very good. CONDUCTOR.

T. HARDCASTLE, PRINTER, CHURCH-STREET, SHEFFIELD.

THE

HORTICULTURAL REGISTER,

OCTOBER 1ST, 1834.

HORTICULTURE.

ARTICLE I.—ON CHEMISTRY,

AS CONNECTED WITH THE DEVELOPEMENT AND GROWTH OF PLANTS.

By the Author of the Domestic Gardeners' Manual.

FIFTH ARTICLE.

LIGHT.—I am now arrived at the point, from which my theory starts: the fulcrum upon which it rests, and by which it is supported.

It is usual to consider *light* as connected with colour; in other words, to view it prismatically; and so viewed, its operation and agency are most mysterious. I leave these considerations, however, to a Newton, or a Göethe: it is to the vegetable, vital principle that I direct my chief attention, in as much as it is the agency of light upon plants, and their sources of nutriment, in which the gardener is most deeply interested.

Lavoisier, writing upon the developement of light, observes (Elem. Vol. 1. p. 54.) "In the present state of our knowledge, we are unable to determine whether light be a modification of *caloric,*" (heat) or if caloric be, on the contrary, a modification of light. This, however, is indisputable, that in a system where only decisive facts are admissible, and where we avoid, as far as possible, to suppose anything *to be* that is not really known to exist, we ought provisionally to distinguish, by distinct terms, such things as are known to produce different effects. We, therefore, distinguish *light* from *caloric;* though we do not, therefore, deny that these have certain qualities in common, &c. &c."

The father of modern chemistry herein, as in most other of his luminous and truly candid statements, made a great advance; but in his day electricity had excited little attention, and was comparatively little known or studied. Perhaps the scientific world is more deeply indebted to the illustrious Davy than to any other individual philo-

sopher, for the identification of electric, with chemical action: he detected phenomena, which led him to the conclusion, (to use the words of Dr. Paris in his life of Davy) "That the evolution of light and heat cannot be ascribed simply to a gas parting with its latent store of etherial fluids," and "That, since all bodies which act powerfully upon each other are in opposite electrical relations of positive and negative, the évolution of *heat and light* may depend upon the annihilation of these opposite states, which will happen whenever they combine."

Respecting highly the authority of the great deceased; and (on the points just referred to in the quotations) agreeing with him as far as we identify what is termed *electricity* and *electrical,* I still cannot bow down, and consent to be restricted to that authority. He cleared the way to a more refined philosophy, and truth is daily becoming more manifest. To render this apparent, I shall refer to what I mentioned in my answer to correspondents at page 239, (*Hort. Reg.* May) of the discovery by the successor, to Sir Humphrey Davy, the amiable Dr. Faraday. I have another motive for recurring to the notice concerning this gentleman; which is, to caution any reader against placing confidence, even in the *scientific notices* of the newspapers, or periodical journals. I had read in more than one of these, an account of the all-pervading "etherial fluid discovered by Dr. F. which, fluid acted, or became revealed in certain definite proportions. I carried my determination into effect, and wrote to that gentleman. The exaggeration of the public report was immediately apparent; but the importance of the discovery actually made, will be so also. I copy the Doctor's own words, as belonging to general science, and not to me individually. In the first instance the word "etherial," is a misprint of *electrical,* for all the Professors' researches lately, have related to Electricity. "I have not given a strong opinion" (he observes) "on the point of *one* fluid, but I do not see a single experiment or fact which proves the existence of two electric fluids rather than one."—"What I have lately done is to shew that the *chemical action of Electricity is perfectly definite,* as definite indeed as the action of ponderable agents: Thus, I have devised and perfected an instrument *by which we can measure voltaic electricity,* and then measuring out the electricity, I find that a *constant quantity* will *decompose* exactly, *equivalents* of *various compounds* however dissimilar in their particular nature they may be."

This is the bare fact—the sum and substance of the discovery, and very grand it is: it is a vast point gained; but it does not immedi-

ately refer to the enquiry I am now engaged in. I mention it, however, as being highly interesting in itself, and as tending to rectify a glaring error on the part of those who affect to disseminate reports of scientific discoveries. However, I request the reader not to lose sight of this simple account which displays the accuracy attained in the prosecution of delicate experiments. I also shall have occasion to notice that modification of light which we term electricity.

From the first moment that I began seriously to reflect upon the philosophy of nature, my mind became imbued with the conviction that one, universal, vivifying principle, is, and has been in active operation from the commencement of time: The unity of creation, the universality of Light, at once require, and prove, this to be the fact. Perhaps, I was first induced to take this comprehensive view of the eternal laws of nature, by the grand and beautiful observation, of the late Professor Playfair, in one of his concluding lectures. "If we consider how many different laws seem to regulate the action of impulse, cohesion, elasticity, chemical affinity, chrystallization, heat, light, magnetism, electricity, galvanism; *the existence of a principle more general than these, and connecting all* of them *with that of gravitation* appears highly probable."

Without at all referring to the theory of Professor Leslie *that the globe is cavernous, replete with light, shining with intense splendour;* I fear not to hazard the assertion that *Light* is the only ethereal substance, or matter, throughout creation that pervades every body in nature. If we admit this fact, we need not perplex our imaginations to discover the one great source of this essence. The *Sun* stands revealed to all, and the life of all creation is dependant on his beams. If this be so, who can doubt that the one great, governing, connecting principle, is at once manifest and apparent."

"*Let there be Light*"—was a word of power, view it in all its bearings, and in what way we please, for the life of all created things was included in the fiat; since, there is not one act of progress or increase, of respiration, decomposition, of electrical or chemical action, that is not, and ever has been, dependant on it for its commencement, continuation and completion. These are bold assertions, but let the doubter turn his eyes to the glorious orb, and consider that its beams have been poured upon the planetary system for a time without known bounds: let him, with the eye of a philosopher, view the mighty arts of incipience and developement that are manifestly, and beyond the reach of question—the result of his power, and he will find himself reduced to the dilemma, of admitting that the light is either absorbed by the surfaces upon which it infringes, or that it

becomes extinguished and lost. That any portion of light should be so extinguished is in direct opposition to all analogy; for, every well investigated phenomenon affords evidence that one eternal routine prevails, that the decomposition of one substance is the formation of another,—that an apparent change, or even destruction, is but a step towards some important completion, and in one word that not one iota of created matter ever was or can be lost.

Now, if the sun's beams have been absorbed, they must lie masked or concealed till they be excited by some powerful stimulus, and when so actuated, they produce the most stupendous phenomena.

I assert then, as the basis of my theory,—of all that I conceive of vegetable, vital action, that Light is universally diffused, that *its source* is the sun, and its *effects*, the revealment of *electricity, magnetism, heat, chemical attraction and repulsion*,—and finally of *gravitation*, acting on the laws of electric induction. For as all bodies when electrified, produce an opposite state in other bodies, when within the range of their influence, so the Sun, being the grand fountain of pure etherial light, and electrising all bodies within the range of its beams, produces a condition in such bodies (primary and secondary) which lead them to attract each other and to be attracted themselves, by *him*, in their turn. *How* these miracles are effected, the human, limited mind can never be able to discover. I admit also that our machinery may never embrace, or confine the minute particles of those essences which are ever in active, ceaseless interchange; but we want not minutiæ: we *see the Sun*; we feel his agency, we behold the mighty effects of his radiance. The Gardener above all is the honoured being, who has, throughout his whole experience, one undeviating routine of proof upon proof. Gladly should I hail the detection, by machinery, of definite proportions of light, that had previously lain masked in bodies under experiment; and verily the phenomena of voltaic electricity, and the discovery of Dr. Faraday, have not left us without a promise of "the great hereafter,"—but if we be not permitted to withdraw the veil, how much more of substance, of reality do we possess than are to be found in the wild undefinable visions of *latent heat*. The very term is a contradiction,—*Heat* that is not manifested is not heat—if it be manifested, or measurable, it is no longer Latent. I know that the same thing may be said *of light*, and I admit that while it remains absorbed, it is not visible; but we have a mighty first cause to go to, which the *caloricians* have no trace of, or claim upon; their's is "a deed without a name"—unless it be a wrong one—an effect without a cause, unless it be inapprecia-

ble. We have the *Sun*, the grand first principle, and we have enough. Humility instructs us to be grateful, and as Lord Bacon would have said, to add "*the superlative of praise—admiration* ;" while we each aspire, "What I know not—teach thou me."

Light pervades, imbues, influences all things, this is the truth of truth. We do not perceive it in a drop of water; yet water contains all the elements of tremendous combustion. This phenomenon is within the detection of the chemist's art. Flint does not manifest light; yet who will doubt its excitability? Hydrogen gas, the lightest of all vapor, is invisible; but let a stream of it be projected through an aperture not wider than the puncture of a pin, upon an atom of spongy platina, the cold metal will instantly be heated to redness, and the exciting gas inflamed. A piece of glass, and a small square of black silk, are both inert, and cold bodies; yet sparks of etherial fire will be elicited by the friction of the two. A lump of white sugar rubbed up with a small portion of chlorate of potass, is a mild and innocent powder; or if it be blended with a little mucilage and attached to one end of a match, it will remain silent for any length of time; but apply the minutest drop of sulphuric acid to either, and the mass will burst out into vivid flame. Vegetables are inert, they obey the sun, they drink his beams; colour is imparted to their foliage, and flower. They decay and wither, and then will, by the application of flame, yield to rapid combustion, and produce matters, the existence of which, could no more be expected, than was the light which blazed from their substance.

Heat may be excited without the revealment of flame, and here is the grand rallying point of the partizans of *latent caloric*, but heat, like all the other phenomena, is but a manifestation of chemical action. I am willing enough to cede the point, that heat becomes revealed, occasionally, without light, and so far to allow *the latent existence of its cause*. I only object to the theory which claims the latency of heat as of a material substance *sui generis*; I seek for a cause and source, and find both in solar light: herein is the reality! The minutiæ, the revealments of all the great natural agents,—electric light, heat magnetism, attraction and repulsion, I conceive to be dependant upon the energy of the *one great principle*, exerted under peculiar circumstances. Philosophers, I trust, are advancing on the road of individual discovery, and they who possess wealth, time, and a refined apparatus may employ them to the greatest advantage. What Davy did, what Faraday is doing, may be but the forerunners of a day of splendour: in the mean time, the Hypothesis I advocate has truth as its base, though I feel utterly powerless in attempting even to think of the tremendous processes which it involves.

Light as applied to vegetable bodies imbued with life, is productive of manifest effects; but it is a mistake to suppose that there can be a state of total seclusion from its influence. It is usual to say that plants, in a dark cellar are void of colour; and, certainly in such a situation, they retain little, if any of the green tint of a healthy growth, exposed to the direct ray; but *air* is replete with light,—this is provable by direct experiment; water abounds with light, and enough may be extracted by vital action, to secure a weak existence, and even some colour. Nothing can be more completely buried in apparent obscurity than the roots of a plant in a pot of mould; but let any one take out the ball of a vine, of an Erythrina laurifolia, &c. &c. and he will soon perceive that the terminal points of the advancing roots are tipped with a pea green tint. A Rhubarb plant growing in a dark corner of a cellar has gorgeous colours—almost a golden yellow, relieved with lively red, yet in a few hours these tints will yield to green, if the plant be removed to air and daylight.

But another manifestation of one of the chemical energies of light, is at hand in all vegetable progress, and that is *electricity*. Hence it is, doubtless, that plants increase most rapidly when atmospheric changes, productive of warm showers, are most active. I speak however of the silent electricity which results from the decomposition of aerial water, and of manuring (that is, nutritive) substances within the range of the rootlets of plants. *Electricity* in masses, produced by our machines, as it has been artificially employed, possesses nothing in common with the silent influence exerted by the passage of atmospheric electricity, inducing a corresponding action about the roots. The one is unnatural, a violent passage of a shock, or at least, of a luminous stream, wholly at variance with the secret energy of native electricity, and destructive of vitality: the other is a gentle, invisible medium, suitable in every sense to the capacity and want of the being which it stimulates. The whole process of nutrition depends, I conceive, upon this electrizing principle of solar light, and *that* will be considered in a future paper. . All that now remains to be adduced in corroboration of this hypothesis of vegetable life, (independently of the *phenomenon of the dew*, of which mention was made in the last paper) is the fact to which I beg the reader to bend his whole powers of reflection. Vegetables are either acted upon, stimulated, and impelled, to the performance of all their vital functions; and if this be fact—then what is *the stimulant*? Or they are beings imbued with life, and having the power of volition, perception and discrimination! Where is the alternative? My own opinion, after mature consideration, is this—that plants are mere instruments,

but most important ones, that they are acted upon by the rays of light, and at the same time, decompose and fix a portion of those rays, and liberate free electricity, by which, chemical action is excited in the manuring substances, sap prepared, and then attracted into the vessels of supply. Hence, that *light* is to vegetables, as well as to the whole creation, the stimulus of the living principle. Its operation during the day,—particularly in bright sunshine,—may be chiefly that of maturation, though I have lately seen facts which satisfy me that *growth* and extension, prevail most in high temperatures, during the day, provided great moisture be supplied. Torpor succeeds to activity, the night is a period of rest and silence, the plant becomes refreshed, and prepared to meet and second the stimulating influences of the succeeding day. Thus all is harmony, perpetual routine, verdure, and maturity; and all are dependant upon the one great principle—*Light.*

July 14*th*, 1834.

ARTICLE II.

ON A FALLACIOUS OBSERVATION, RESPECTING THE GERMINATION OF SEEDS.—By W.

I was much surprised last week, to meet with the following extract in a newspaper, taken from Loudon's Encyclopedia of Gardening.

Germination of seeds.—" Seeds will not germinate in the light, because light decomposes the carbonic acid gas, expels the oxygen, and fixes the carbon, thus hardening all parts of the seed, and preventing vegetation.* * * * *

The conditions which are necessary for the germination of seeds, are heat, moisture, and darkness. * * *

I turned to the page, on the germination of seeds in our own copy (the fourth edition) of the Encyclopedia of Gardening, and find the above passage to be worded thus:

" The seed sown, must be defended from the action of the rays of light. This has no doubt been long known to be a necessary condition of germination, if we regard the practice of the harrowing or raking in of the grains or seeds, sown by the farmer or gardener, as being founded upon it.—*Ency. of Gar. Page* 158, 4*th edition.*

I repeat, that I was surprised to meet with such a passage, as either the one or the other of the above, in a work professing, or which ought to profess to teach the art of gardening upon the most scientific principles. The glaring incorrectness of the assertion, struck me immediately; and I wondered that the indefatigable compiler of that la-

borious work, should have allowed it to escape his observation. If *darkness* be "*necessary*" for the germination of seeds, how does it happen that the whole continent of America—for example—was not a barren desert,—before it was inhabited,—instead of having been then,—and being still, overloaded with every kind of luxuriant vegetation?

All self-sown seeds remain on the surface of the soil, *exposed* to the "action of the rays of light;" and notwithstanding these terrible chemical processes,— of "*decomposing the carbonic acid gas,*"—and "*expelling the oxygen,*"—and "*fixing the carbon*" and "*thus, hardening all parts of the seed, and preventing vegetation,*" the vast prairies are every year clothed with fresh verdure, from the deposited seeds; and each stately tree, in the illimitable forests, has continued to provide successors during every revolving autumnal season, since the creation of the world.

So notoriously true is the certainty of renewal, that it has been asserted, that no plant has been lost, since the mighty fiat went forth, "in the beginning."

No "*harrowing,*" no "*raking,*" in a state of nature is required, or could be procured.

The compiler of the work in question cannot intend to infer that the husk which envelopes the vital principle, is the "*darkness*" that is "*necessary;*" for he talks of the "*harrowing,*" which means covering over with earth, to keep them from the action of this pernicious "*light.*" If "germination" means sprouting, every person of the least observation, must be familiar with innumerable instances of the first appearance of the germ growing in daylight:—the first push from the bulb in a hyacinth glass, in the full glare of a sunny window:* the tiny radicle that looks out eagerly into this gay world, from the husk of a chesnut, before it is consigned to its dark abode, to grow and become a tree:—the position of a flighty seed of dandelion that has winged its way from the beautifully arranged head (one of the loveliest objects in nature,) and settled against an edging of box,—whence it sends down a long taper thread to find a resting place beneath:—mustard and cress, scattered by the prodigal hand of childhood, opening their little cells, and putting forth simultaneously, their cotyledons and rootlets upon the surface of the ground; or upon a piece of flannel, by the side of a blazing kitchen fire, where no friendly earth is near, to receive the latter into this *necessary darkness*. A more obvious refutation, of this assertion, however, is to be found in the sprouting of wheat, which has been unfortunately

* I am aware that this is rather an analogy, than a corroborative case in point,—the bulb not being a seed.

exposed to the influence of moist heat, while standing in shocks; a melancholy proof of which, has this very morning been brought to me, from a neighbour's field. Every ear is bristled with long white roots; and a hue of green from the germs pervades the whole.—These seeds have germinated in the broad glare of day, three or four feet from the surface of the earth! Not to tire with too many proofs, all of which are of easy observation; I will mention only one or two more: the obvious fact, that all self-sown seeds of garden vegetables, produce invariably the healthiest plants;—peas, which have been scratched up by birds to the surface of the ground, will, if their position be reversed by the operation, actually push their *roots* first into the light and air, in their endeavour to reach their natural situation. Indeed there are seeds which will not vegetate in darkness, the birch for example, that *must be scattered on the* soil, and not buried in it, in order to effect their due vegetation.

The operation of harrowing, is obviously *not* to cover up the seeds from the action of light; but to preserve the fruits of man's labour, for his own use, to the exclusion of birds, insects and vermin, all of whom would else dispute with him their share of the food, which was equally designed for their benefit as for that of the lords of the earth. Frosts too, would injure and destroy these seeds which are not indigenous to the soil in which they are sown. The noble science of chemistry, is perfectly innocent of the charge here brought against it, of working this mighty mischief to the seeds of vegetation; yet will this imposing paragraph that I have transcribed, wander the round of the newspapers;—and people will read it, and think it so clever;—and all that array of carbon, and oxygen, and carbonic acid gas, will look so unmeasurable;—and science will be thought to be striding over our vegetation with *such* seven league boots;—when lo! a little jack the giant killer—i. e.—common observation, sets the matter in its proper light,—the wonder subsides,—and all is right again.

How necessary it is,—that although we may rejoice in, and be grateful for the stores of knowledge, which are opened to us, that we should be led by no one; and resolve, to think for ourselves.

August 1st, 1834.

ARTICLE III.

COMPARISON OF THE BOTANICAL SYSTEMS OF CLASSIFICATION.

By the Author of the Domestic Gardeners' Manual.

Systems are essentially useful; the mind wanders in doubt, unless it have something definite and well arranged to rest upon. In the earlier periods of science, when the light began to dawn, men of learning and observation attempted to form arrangements; and great praise is due to them as the pioneers to improved science, and for having paved the way for more simple and refined modes of classification. Tournefort and Ray—are names which will never be forgotten; but to Linnæus, the palm of excellence will ever be accorded.

But the botanical System of the renowned Swede is artificial; and as such, must contain great anomalies and irregularities; for how can the mere number, position, and arrangement of the stamens, or fertilising organs of a flower, paramountly govern the classification of the vegetable families? Flowers of different plants may contain precisely the same number of stamens; yet the *structure* of the flower, the general appearance of the plant, and above all the organization and arrangement of the fructiferous organs may be so essentially dissimilar, as to preclude the possibility of any existing relationship. The System of Linnæus will ever inspire admiration, because it affords facilities to botanical investigators of which, preceding systems presented no comparative example. But Linnæus himself prospectively contemplated a *natural* system, and indeed partially constructed one. Witness the *grasses*, a purely natural order, in the second order of his *third class*—the *umbellatæ* in the second order of the fifth class; the *cruciform* flowers of the fifteenth, and so on. His sole aim, as Dr. Smith observes, is to help any one to learn the name and history of an unknown plant in the most easy and certain manner, *by first* determining its class and order, in this (the artificial) system; after which, its genus is to be made out by comparing the parts of fructification with all the generic characters of that order." (*Int. to Bot.* chap. 23.)

A natural system was attempted by the celebrated Jussieu, Bernard and Antoine: the *Genera Plantarum* arranged in natural *orders*—Dr. Smith described as, "the most learned work that has appeared since the *Species Plantarum* of Linnæus. Bernard died in 1777. The defects of this system may be appreciated by the following passage, from Smith's *Introduction.*—" A student may acquire a competent knowledge of natural orders, with very great pleasure to

himself, by *repeatedly turning over the work* of Jussieu, with any KNOWN *plants* in his hand, and contemplating their essential generic characters in the first place; and then what regards their habits and affinities; proceeding afterwards, to combine in his own mind, their several points of agreement, till he is competent to form an idea of those assemblages which constitute natural classes and orders."

Jussieu left the work unfinished, and the student was involved in difficulty and embarrassment. To Linnæus then, he was obliged to have recourse, and thereby, he was enabled to determine the position, and the name of his plant. Thus things remained till an author of comparatively recent fame sprang up, who gave promise to illuminate the natural classification, and remove those obstacles which threatened to prove an insurmountable bar to its general adoption. To Doctor Lindley we are indebted for all that has in reality been effected:—without his science, his ability, and strenuous exertions, the *Natural System* of Botany would have remained a dead letter, a sealed book to the many. His "*Introductions*" have effected a great revolution, and science is deeply indebted to him.

His task has been Herculean, and his labour enormous. The chief difficulty which he had to contend with was that, which must still form the obstacle to the general adoption of the system, *the prodigious number of orders that is required to receive the great and increasing volume of subjects.* So anomalous are plants, so various, and complicated their structure, that a very considerable number of the orders contain but a *single individual genus. Twenty-four* classes only exist in the Linnæan artificial system; and these comprise all the known tribes of plants: *Above two hundred orders* are already attached to the *natural system,* and more remains to be added, as new and strange plants shall be introduced. The task however is in worthy and able hands, and he who has done so much, may effect the whole.

A work has just appeared from the Pen of Dr. Lindley, entitled, LADIES' BOTANY, or a Familiar Introduction to the Study of the *Natural System of Botany.*—Ridgway—8vo. 16s. It is a beautiful and most interesting production. The avowed object of the learned author is to present "an elementary introduction to the modern method of studying systematic Botany"—and ably has he accomplished it. Difficulties will, and must remain, but he has so simplified the work of investigation, that they who once trembled at the attempt of self instruction, may now, with this book in hand, (as far as it extends,) commence with assured certainty of success. Dr. Lindley has pointed out the defects of the Artificial System; and he

has proved that its chief claim to merit is to be traced to "the facility with which it enables any one, hitherto unpractised in Botany, to arrive at a knowledge of the genus and species of a plant." This, by the bye—is a most important circumstance, and if it can be established as a fact must be regarded as a very strong argument. That which facilitates the acquirement of a knowledge of genera and species must possess great excellence; but it falls far short of that which is a pure, elegant and enlightening *Science*. I regret much that time and space are not allowed to me to follow up the line of reasoning whereby Dr. Lindley endeavours to draw a comparison between the two systems: he is a zealous convert, and he argues zealously, effectively, in behalf of the system which he has embraced. He has done more than this. His book contains twenty-five letters, couched in the most simple, clear, and instructive language. These letters are individually introduced with a beautifully engraved copper plate, each containing two or more subjects, illustrative of as many orders. Every plate is a complete dissection of a plant, and every letter a sufficiently comprehensive (in some instances a very minute) definition of the plates. There is nothing to be regretted, but the price of the work, which may place it in far too few hands; and, the limitation of the matter. If fifty orders be rendered perspicuous, if the seal be removed from a part of the Cabinet of Knowledge, one hundred and fifty orders remain more or less in obscurity, and require to be laid open. It is in vain that the worthy author refers to *other systematic works*, they—the uninitiated—who have once perused his letters, have entered his style, and have gone step by step with him in his simple and yet erudite elucidations, will not be content to refer to other dark and ponderous volumes—oh no—having once begun,—"having set his hand to the plough, he must go on," if he wish his readers really to appreciate the various modifications of organization that connect one tribe of plants with another, and to understand the infinite wisdom and beautiful simplicity of design, which is so visible in the vegetable world; the just appreciation of which, through countless gradations of form, structure and modes of existence, it should be the constant aim of the Botanist to demonstrate." See preface page xiii.

The reader must now be referred to the work itself, for in no other way can justice be done it. An extract from the Sixth Letter, page 86, will exhibit the delicate tact of the author, by which he leads his pupils in the road to knowledge; the simplicity of the style charms, while the perspicuity of the investigation instructs: thus, ever, should the young mind be enticed to study and observation.—Imagine a copper plate drawing with seven figures, to face the heading of the

letter; the central figure is the shoot of a *mallow*, with four leaves and their supporting stipulæ; (which adjuncts, I observe in passing, appear to me to act as an *involucrum* of *defense* prior to the growth and expansion of the leaf,)—one expanded flower, and *one* not yet uncoiled,—also a fruit. 2, the pistil with its seeds magnified: a separate, magnified, stamen is shown just above the pistil; 3 an immature fruit, with its closed calyx; 4 a ripe fruit; 5 one of the *Carpels* or seed-vessels separated; 6 the same opened to exhibit the embryo of a future plant; and the radicle. Here is a plant and its organs of fructification dissected; and now let the author speak.

"Well do I remember the pleasure I used to have, when a little fellow just sent to school, in gathering cheeses out of the hedges: it was my first step in Botany; and it was not without pride that I found myself able to shew my less learned companions how to distinguish the plants that bore those delicacies. Many years after, when the cares and pleasures of life had blotted out all remembrance of the joys of childhood, I was passing a few days in Normandy with my friend Mr. de P., when, one day, his little girls came running to me with their hands filled with fine plump *fromageons*; I know not whether it was the association of ideas that the well-remembered word conjured up, or the sweet countenances of those dear children, joy painted in their black and sparkling eyes, and health in their rosy cheeks—but I ate their fromageons with as much delight as ever, and fancied them as superior to all the fruits of the garden in flavour, as they are in perfect symmetry of form."

Only compare a vegetable cheese with all that is exquisite in marking, or beautiful in arrangement, in the works of man; and how poor and contemptible do the latter appear! Not only, when seeing it with the naked eye are we struck with admiration at the wondrous perfection and skill with which so obscure a point in the creation is constructed; but, using our microscope, surprise is converted into amazement when we behold fresh beauties constantly revealed, as the magnifying power is increased, till at last, when the latter reaches its limit, we find ourselves still regarding a lovely prospect, the horizon of which recedes as we advance. Nor is it alone externally that this inimitable beauty is to be discovered; cut the cheese across, and every slice brings to view cells, and partitions, and seeds, and embryos, arranged with an unvarying regularity, which would be past belief, if we did not know from experience, how far beyond all that the mind can conceive, is the symmetry with which the works of nature are constructed.

Look then who list, your gazeful eyes to feede
With sighte of that is faire, look on the frame
Of this wide universe, and therein reade
The endless forms of creatures, which by name
Thou canst not count; much less their natures crime;
All which are made with wondrous wise intent,
And all with admirable beauty blent.

"I perceive, I have been talking of these curious productions, as if you were already acquainted with them; while it is quite possible that you are not. In that case, step to the road-side, or to the first patch of weeds you can meet with, and there you will be sure to find what is called a Mallow; we have two very common sorts; one of which has small pink flowers, the other, large striped purple ones, the latter is one of our handsomest wild flowers, and is called 'the common', or, *the larger mallow* (malva sylvestris); it is that you are to take as the subject of your study.

"This plant grows, two, or even three feet high, in places where it is not cropped by cattle. It has an erect branching stem, of a very pale green, covered all over with longish hairs, which frequently spring from the surface of the stem in starry (or as we pedantically say, *stellati*) clusters. The leaves are roundish, and divided into about five shallow lobes, the border of which is notched: their veins are netted. At the base of the leaf-stalk grows a pair of small stipules, resembling scales.

"From the bosom of the leaves spring the flowers singly. Below the calyx are placed three small *bracts* forming an involucre (fig. 3.) The calyx is composed of five sepals, joined together about halfway; it is quite soft, with long delicate hairs. Five large rosy-purple, striped petals, each of which has almost the figure of a wedge, and is notched at the end, constitute the corolla, which spreads wide open, when its proper time for unfolding arrives; before that time, its petals were curiously twisted together. The stamens are very different from any that we have yet examined; they consist of a hollow column, bearing at its end, a great number of anthers,* each of which has a short filament, and is of a kidney shape, containing only one cell instead of two, as is usual. Formerly Botanists were contented to call this column, a column, and to enquire no further; as if they thought it was some new and special organ found only in the mallow. At the present day, we are too curious to be thus easily contented, and we must have the exact nature of every part explained.

* This single feature forms the Linnean Class monadelphia in which the mallows, Hibiscuses, &c. stand conspicuous members. $\frac{D.}{T.}$

This column, then, is caused by the filaments growing fast together, when they are very young, without being able to separate afterwards, except just at the top, where they look like filaments. Suppose the stamens of the Tutsan were joined together in this way, when young, you would have exactly such a column as is constantly produced in the mallow.

"The next object of examination is the pistil (fig. 2); it is formed of several carpels, which grow together in a circle round a common centre, and so form a sort of flat plate, from the middle of which the style arises. Like the filaments, the styles also grow together at the bottom into a column, but they soon separate again, and then you may tell by counting them, that each carpel has its own style, for there is exactly as many styles as carpels.

"Last comes our acquaintance, the cheese, in the shape of the nearly ripe fruit; we will suppose it to be quite ripe (fig. 4), for the sake of avoiding repetition. It consists of a number of dry carpels which will separate readily from each other, and from the central body to which they were originally joined. Each carpel (fig. 5) contains one seed, with an embryo curiously doubled up, and filling the whole of the cavity; hence, as the carpels are all of the same size, and arranged with the most exact regularity on the same level, if a fruit is cut through it will present a singularly beautiful arrangement of the parts, which look like a vegetable star. In the centre, if the fruit is not ripe, is a solid circle from which eleven rays branch off at the regular distances, each being subdivided into two. Between the rays lie eleven embryos, the various convolutions of which, as cut through with the knife, exhibit eleven areas of strange patterns. The Kaleidoscope itself can produce nothing prettier than this, except in colour.

"This account is that of all the *mallow tribe* in most respects; and is quite sufficient to enable you to identify it: a power that it is useful to possess, because *the species are* all perfectly innocent. The *columnar stamens* themselves suffice in a majority of cases."

I wish that my hints would enable me to present the reader with the luminous dissection of one of the grass-tribe *(glumaceous)*: whereby the author,—setting aside the useless and troublesome distinctions of *Calyx*, *Corolla*, *Nectary*, with which the older botanists confused the simple *husks* of the *Gramineæ*, has rendered the investigation of this important tribe, an operation of comparative facility. But I must refrain, and satisfy myself with soliciting attention to the few following observations. It will be manifest from the extract given, that the *natural system*, as illustrated by Dr. Lindley, is one of

Physiological Botany: he who practically understands it, will know a great deal of the internal structure of plants, from their *nidus* in the seed, to their fully developed state when in flower and fruit. The cause, origin and uses of all parts are investigated, and nothing is left to conjecture which can be detected by analysis.

Thus, Botany becomes essentially a SCIENCE! But shall we abandon the Linnæan classification?—I for one, say no! out of gratitude alone, to that by which I was,—(unassisted by any teacher,) enabled to acquire all that I know of botany; and which has enabled me, during thirty years, to discover almost all that I sought to determine. I give my voice to retain a piece of mechanism (defective in some degree doubtless), but so refined as that is, which can effect discoveries so interesting—until we obtain a complete GENERA plantarum, founded upon the *natural* system.

Let me be understood, as things *are,* I say, let us cultivate the *natural system,* under a guide so accomplished as is Doctor Lindley, —as the *foundation* of our botanical science; but let us also consult the Linnæan arrangement in order to discover the *Genera.* I said prospectively when I first saw announced—"THE LADIES' BOTANY" —that, I hailed the forth-coming work. Now, having perused it, I bid it welcome; and from my heart urge the Ladies particularly, to make it their own guide, and the pattern of instruction for their daughters. *Let it be known,* let it be introduced into every library, reading-room, and seminary throughout Britain, let it become the class-book of botanical study; and if through *its price,* it be denied to many who would gladly possess such a source of instruction; let two, three, or more, club their contributions, and make a partnership of that which it might be inconvenient to possess singly. I trust that a cheaper edition may be contrived and executed; but above all, I hope that the author will enlarge his plan, and never desist from his zealous efforts, till he have elucidated *all* the natural orders, and, ultimately the individual families of the vegetable world. We render him, however, our cordial thanks for what he has effected, we venerate his zeal, and estimate his labours.

"Benè sit, benè eveniat, benè vertat."

Plautus.

ARTICLE IV.

THE INJURY SUSTAINED BY WALL-TREES,

From a course of Vegetable Culture, prevented by a mode of occupying the ground with Fruit-Trees.

BY MR. MOSES BRISTOW, BURTON, LEICESTERSHIRE.

It has, I think, been fully ascertained, by the united experience of many years, that the common practice of cropping the borders with vegetables, on which fruit trees are planted and trained against the walls, is very injurious to the well being of the trees; by withdrawing a very considerable portion of the nourishment from the soil, which ought to have supported the trees; and by the roots of the trees being from time to time impaired by having their fibres torn away, in digging the borders, which perhaps takes place two or three times in the year. These fine fibres are of essential importance to the tree, for it is only by them that a large portion of nutriment is imbibed for its support, and when they rise to within a few inches of the surface of the soil, a superior kind of nutriment is obtained, without which the fruit never attains its proper size or flavour.

In order to remedy this evil: that of injuring the trees by cropping,—I have adopted a plan which I have now practised for three years, with the very best success, in reference to such trees as are situated on South-East, East, or South borders, which, whilst it occupies only the same space of ground, will produce fruit worth double or treble the value of the few early vegetables generally produced on it.

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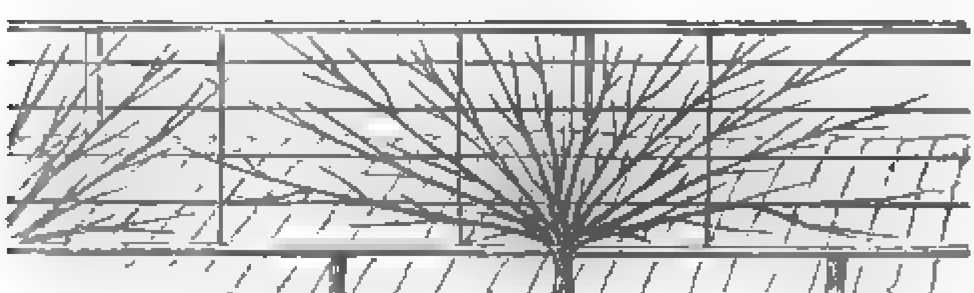
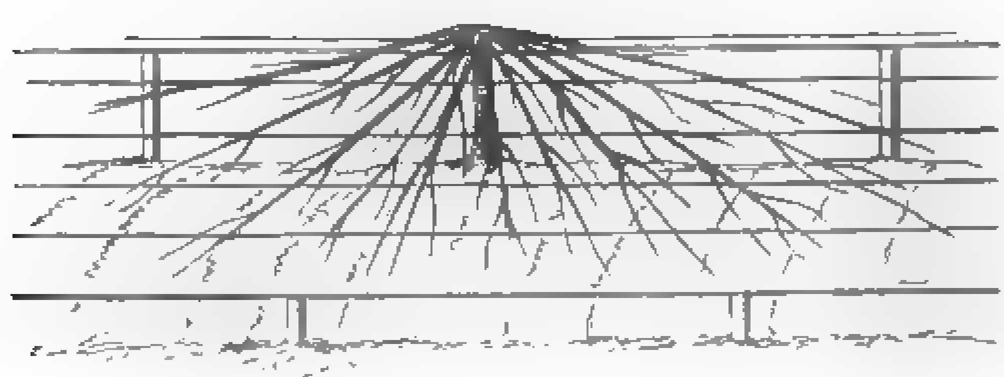


The plan is that of training a row of fruit trees over the borders on a trellis, made of either thin bars of iron or wood, as fig. 29. I find in this situation the crops are excellent, the fruit grows very fine, and ripens much sooner than either standards, dwarfs, or espaliers trained in the usual way, because of the large portion of heat received by the reflection of the sun from the ground. At present, I have only tried the experiment on the common borders of mould, yet I have no doubt great advantage might be derived, by a brick or tile

floor being laid under the trellis, which would much increase the reflection. If it is needful to protect the crop from frost, the trees are easily covered with mats, or by a roll of canvass being laid over them at nights, particularly during the blossom season.

The most convenient dimensions for the trellis work, will, I think, be found as follows:—The border will be about sixteen feet across,—the trees should be planted one foot from the walk,—the trellis should be one foot high in front, four feet high at the back, and eight feet wide, making in the whole nine feet of the width of the border occupied, the remaining seven feet, betwixt the back of the trellis and the wall, should be left unoccupied for the convenience of being able to prune and dress or gather fruit from the trees occupying the wall. I must here observe, however, that neither peaches nor nectarines will answer on the trellis, but all the fine varieties of plums, cherries, and apples thrive admirably, and have a very superior appearance to common vegetables, which with equal facility might be grown on quarters, with a little contrivance, or under board or reed fences.

30



The plan here noticed by Mr. Bristow certainly merits attention, the ground by this mode being much more advantageously occupied than it could possibly be by the choicest vegetables, but it could not in all cases be adopted, particularly where quantity of land is an object, or where fruit is not so much in requisition as vegetables. But the principle is good, and it may be followed up where it suits the convenience of parties. If the trees on the trellis be kept thin of wood, no evil can arise from the ground being heavily shaded, but on the contrary in dry seasons some advantage may be the consequence. Twelve months previous to our receiving the above paper, which is now nearly a year ago, we had tried a similar mode at Chatsworth, of occupying a fruit border on a south aspect eight feet wide, only with this difference, that the trees instead of being planted at the front of the trellis and trained upwards, were planted at the back (fig. 30) and trained downwards. The advantage of this mode

arises from the check given to the circulation of the sap, by which means more fruit is produced with less luxuriance in growth. The naked bole of the tree is also hid from the sight. Having lately had occasion to visit some parts of Lancashire, we found the same plan of training about to be adopted on the whole of the fruit borders at Rossel-Hall, near Poulton, the seat of Hesketh Fleetwood, Esq. except that the cross bearers and posts are constructed of iron instead of wood, all the longitudinal bars were to be made of wood. In our's, at Chatsworth, the trellis is about seven feet six inches wide, within which breadth there are nine longitudinal deal bars, one inch wide and an inch and a half deep; the cross bearers on which the bars rest are three feet six inches distant, and two inches and a half broad, and one inch a half deep, and are nailed on the top of square posts sunk into the ground at the back and front of the trellis. These posts are two inches and a half square; there is also another row of posts, along the centre of the cross bearers, seven feet distant from each other. The height of the trellis in the front is one foot, and two feet at the back. The whole cost for wood, nails, and labour would amount to about two shillings per yard, and for paint and painting the same, sixpence per yard. This would include any turnings round the edges of the walks—or other little alterations in the form which might be necessary. If the bars were placed closer together, of course the expense would be greater.

ARTICLE V.

OPERATIONS IN THE FRUIT AND KITCHEN-GARDEN,

FOR OCTOBER.

FRUIT DEPARTMENT.

Apples should now be gathered in fine days, and carefully placed in the fruit-room, packed in earthen jars, and placed in a dry cellar, or pitted after the manner of potatoes.

Cherry-Trees, which have been infested during the summer with the black louse, (Aphis Cerasi,) should have a good syringing with a mixture of soap-suds and tobacco-water.

Fig-Trees.—About the end of the month, Fig-trees, on the open walls, may be pruned and nailed. Cut away all those old shoots that have gained the top of the wall, on purpose to give place to the last year's shoots that are in the rear.

Gooseberry and Currant-Trees may be pruned when the leaves have fallen. Leave a good supply of young wood from the bottom.

Grapes.—Vines in pots being brought into the Vinery, will ripen their fruit in February. Those forced early, if the wood be ripe, should be exposed to the open air, to prepare them for forcing again.

Peach and Nectarine Trees on the walls will begin to cast their leaves towards the end, and it will be an advantage slightly to brush them upwards with a small birch or ling wisk, to clear the leaves from the branches. Keep them close nailed to the wall this month, or they will be liable to be broken by the wind. If the wood be unripe, and the walls against which they are trained be flued, put in some fire to ripen the wood off, for on this depends the future crop.

Planting.—Fruit-trees of all descriptions should be planted as early in the month as is convenient, to establish them in their new situations before severe weather comes. After all the leaves have fallen, planting may cease until early in the spring.

Raspberries.—Make new plantations of raspberries upon prepared ground. Towards the end, manure the old stools. Pot a quantity for forcing.

Strawberries, intended for forcing, should stand in a south aspect, if convenient. New beds may still be made, but it is better not to do this later than September; for when the plants are small and newly planted, the frost generally draws them out of the ground again.

VEGETABLE DEPARTMENT.

Cabbages for spring crops, should be planted. Prick out a bed, to fill up with in the spring, or to plant for a second crop.

Broccoli.—The Green and Purple Cape, Grange's Early White, Early Sprouting Purple, and Impregnated Early White, will continue in use, if the weather be favourable, from this time to Christmas. The Tall Large-headed Purple, the Portsmouth, the Sulphur-coloured, the Spring White, the Dwarf Purple, and the Siberian, should be taken up, about the end of this month or beginning of next, disturbing the roots as little as possible. Dig a trench, and lay them in a sloping direction, about eighteen inches apart, with their heads towards the north, and only a few inches above the ground. Cover in the trench, and open another, laying the heads of the next plants over the roots of the first row, and so proceed until the whole are laid down. The crowns of the plants thus lying low, are soon covered with the snow, and preserved from the severity of the frosts.

Beet-Root should be taken up and preserved in a cellar or shed.

Carrots, for winter use, should be taken up, and preserved in the same manner as beet-root.

Cauliflowers should be planted on a south aspect, under hand-glasses in frames, and close under a south wall. Let some be potted in sixty-sized pots, and sheltered in a frame, to turn out in spring for the first crop.

Lettuces, to stand the winter, should be planted close under a south wall, and some in frames, lest those under the wall should be destroyed.

Herbs, for forcing, should be potted, as mint, tarragon, &c.

Onions must be housed without delay, if this were not done last month.

Asparagus Beds may receive a top-dressing towards the end of the present or beginning of next month.

Potatoes must be taken up, or they will be injured by the frost.

Radishes sown on an old hotbed, will come into use about Christmas.

FLORICULTURE.

ARTICLE VI.—A DAISY EXTRACTOR.

BY VIOLA.

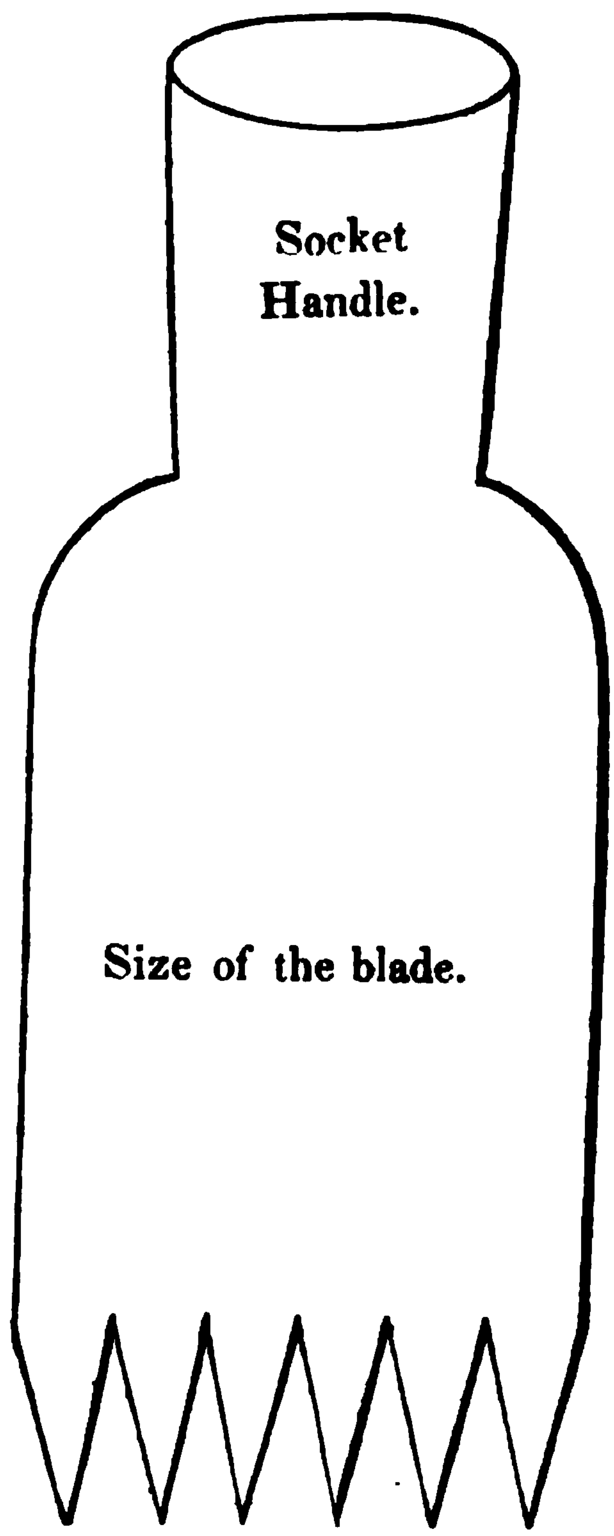
In winter, when the fields are bare, and all the weeds are shut up in their safe and quiet cells, beneath the sheltering turf, a bright warm day, will seldom fail to lure abroad, one or two of the aboriginal daisies, to cheer the casual footsteps of the wanderer who takes "a Winter's walk at noon."

Then the little daring strangers find a welcome; then are their chearful eyes greeted by equally charming eyes of Childhood; and many a Chaucer's darling," is brought in, to linger out its three days of beauty, among the groups of exotics, that decorate the vase upon the mantle-shelf.

But nipping frosts will yield to the influence of genial airs,—as a harsh spirit is subdued by gentleness;—and then the fields are gay with flowers; and the erewhile friendly winter daisies come out in crowds, and the pasture that had been cheered,—becomes not only disfigured, but spoiled by their *over population*; and now our lawns are daily mown with "daisy cutters,"—and are strewn with their heads in littering heaps: Now too, the discovery of a more efficient mode of destroying the intrusive weed, would be a "consummation, devoutly to be wished:" and this is, I believe, accomplished, in the little instrument of which I send a drawing and description. The desirableness of such a tool had long been obvious,—the inefficiency of the

"cutter," had been even more so; for the frequent decapitation of the heads increased the evil, by strengthening their roots. These latter too, as is well known, ramify from a tough centre, and are with difficulty extracted from the soil.

31



A small spud hoe, about an inch in width, had been tried, and found to be ineffectual, since how deeply soever we might insert it,—the ramifications remained, and they would sprout again; besides that a sharp instrument would be likely to cut the roots of the surrounding grass. I therefore had a small spud made, with teeth, of the annexed size and figure, (31) which was fixed into a long handle: and with this little tool in the month of April last,—before the grass was shut up for hay, (of which however, there has been little indeed,) I used to amuse myself for hours, by raising the roots out of the turf, *entire.*

The settled drought of the spring, prevented me from trying my skill upon the daisies on the lawn, because the bare spots left by the roots, would have been unsightly, unless rain had immediately fallen, to nourish and cause the grass to grow, and cover them with verdure. The plan is however perfect,—the occupation, to my taste,—the benefit essential, and the employment, not only not fatiguing, but really not ungraceful. A walk in a spring meadow, is thus rendered doubly delightful; for many a flower that would otherwise "be born to blush unseen," &c. is by this means brought into notice,—a temptation to prolong a stroll is offered, and the *utile et dulce,* are united. I should add that the bulbous rooted ranunculus, (buttercup) the hawkweed, and others that afford a fulcrum, yield to the lever I employ, for unless the ground be hard, no fibre will remain. I hope to hear next year, that other females have tried my useful employment with the success and gratification that it has afforded me.

July, 1834.

ARTICLE VII.

OBSERVATIONS ON THE CULTURE OF ORCHIDEOUS PLANTS.

BY DR. LINDLEY.

(Extracted from the Botanical Register, for 1699)

It is well known that the most considerable part of the Epiphytal Orchideæ is found in the greatest vigour in damp sultry woods of tropical countries; and accordingly we endeavour, in our artificial cultivation, to form an atmosphere for them as nearly as possible like that which they would naturally breath in such stations.

But it is sufficiently evident, that, although this kind of treatment is admirably suited to a considerable number, there are others which grow most unwillingly, or scarcely survive, under such circumstances. For instance, *Dendrobium speciosum* languishes in situations where the *Stanhopeas* are in their greatest splendour: and the Chinese Bletias almost perish by the side of Eulophia and Zygopetalon. This arises from the great difference in their respective constitutions, which are each adapted to distinct conditions of life, and our failure arises from our mistaking a general principle for an universal law. If a great majority of Epiphytal Orchideæ swarms in damp tropical forests, there is a considerable minority which lives in an entirely different climate. This is the genus Oncidium, where almost all the species are of tropical habits, O. nubigenum is only found on the cool mountains of Peru, at the height of 14,000 feet; it will, therefore, require a different treatment, altogether distinct from that of the mass of the genus. Dendrobium moniliform, and Catenatum, again occur only in Japan, as far north as 37 deg. or 38 deg., or the parrellel of Lisbon, and are periodically subject to a very low temperature.

But the most remarkable instances of a disposition on the part of some Orchideous Epiphytes to depart from the ordinary habits of the tribe are found in Australia, and its dependency, New Zealand.

ARTICLE VIII.—NEW AND RARE PLANTS,

FIGURED IN THE PERIODICALS FOR OCTOBER.

CLASS I.—PLANTS WITH TWO COTYLEDONES OR SEED-LEAVES.

RANUNCULACEÆ.

CLEMATIS MONTANA.—Mountain Virgin's Bower. This species was originally collected by Dr. Francis Hamilton, at Chitlong, in the valley of Nepal, flowering in April, and it appears to be a pretty general plant on the mountains, at an elevation of, from 5000 to 7000 feet above the level of the sea. It proves to be quite hardy, and seems to flourish as well in the climate of England as on its native mountains. It loves a loamy soil, and is readily multiplied by layers.—*Brit. Flow. Gard.* 253.

SOLANEÆ.

NEIREMBERGIA ARISTATA.—Bristle-pointed Nierembergia. A native of the sandy plains on the banks of the Parana, where it was discovered by Mr. Tweedie, and from seeds transmitted by him to Mr. Neill, the plant was raised in the garden at Cannonmills, in 1832. In habit it comes very near to *gracilis* and *filicaulis*, but is essentially different. Flowers purplish white. It thrives best in a mixture of peat and sand, and roots freely at every joint, if the branches are allowed to lie on the surface of the earth.—*Brit. Fl. Gard.* 255.

CAMPANULACEÆ.

CAMPANULA DIVERGENS, Spreading Bell-flower. This is not surpassed in beauty by *C. Medium*, which it resembles in habit, and by several botanists it has even been regarded as the normal state of that species. It occurs wild in Hungary, Transylvania, the Bannat of Temeswar, and also in Siberia. Flowers of a deep violet colour, about an inch long. It delights in a light gravelly, or chalky soil, and produces its seeds abundantly. It occurs frequently in gardens under the name of *pulcherrima*, but whether it is identical with the plant so called by Schrank we are uncertain.—*Brit. Fl. Gard.* 256.

CAMPANULA MACRANTHA POLYANTHA, Large-flowered Giant Bell-flower, many-blossomed variety. Alphouse De Candolle, in his valuable work on the Campanulaceæ, as well as Dr. Sims, and lately even Dr. Fischer himself, are of opinion, that the present Bell-flower, is only to be considered a variety of the *C. latifolia*: but on a careful comparison of the two, growing side by side in the Glasgow Botanic Garden, Dr. Hooker could not but look upon them as really distinct. Besides the much larger and deeper blue colour of the

flowers, the calyx is far more obtuse at the base, the leaves are much broader and coarser, and of a darker colour, and the whole plant is stouter and stronger.—*Botanical Magazine.* 3347.

LEGUMINOSÆ

ACACIA LINEATA, Narrow Lined-leaved Acacia.—A shrub of bushy growth, frequent in the interior of New South Wales, in barren forest-grounds lying West from Wellington Valley, in longitude 148 deg. East; as also in the country on the North from the settlement of Bathurst, where it flowers throughout the winter months, May—July, and ripens its legumes in December.—*Bot. Mag.* 3346. Flowers yellow. The plant requires the greenhouse.

INDIGOFERA VIOLACEA, Purple Indigo Plant. This very handsome shrub has stood for several years in the open air, in the Botanic Garden, Edinburgh, and flowered for the first time in July, 1834. The flowers are large and handsome, and of a bright rose colour.—*Bot. Mag.* 3348.

LUPINUS NANUS, Dwarf Lupine.—We have no prettier annual than this little Lupine, which has recently been introduced from California by the Horticultural Society. It forms a low tufted plant, from six inches to a foot in height, producing a succession of upright shoots, terminated by several tiers of flowers, which continue to open in succession for two months. The colours being bright purple, intermingled with white and rose, a gay variegated appearance is produced, which is extremely agreeable, when the plant is grown in masses. It is well adapted for covering flower-beds, or for forming a compartment in a parterre, or for the edge of a small clump, or in short for any purpose which requires neatness and a protracted blooming. If sown in the autumn, it will flower in May and June; if sown in spring, it will be in beauty in August and September: and by deferring the period of sowing till the beginning of June, it may be made to blossom as late as November.—*Botan. Reg.* 1705.

RUBIACEÆ.

GARDENIA FLORIDA *simplici,* Single-flowered Cape Jasmine.—This flowered at Wentworth, in June, 1834, and differs chiefly from the G. florida in the greater length of the tube of the corolla, and in the leaves being much more crowded towards the extremities of the branches.—*Bot. Mag.* 3349.

ERICEÆ.

AZALEA INDICA *lateritia,* Brick-red Chinese Azalea.—This plant is remarkably bushy. Its foliage is a rich deep green, to which a slight rusty tinge is given by the numerous brown hairs of the midrib and margin: the leaves are narrow, very blunt, and remarkably

covered with hairs, which give their surface a rough appearance; the flowers are of a bright clear brick-colour, a little tinged with rose. It will no doubt require the same treatment as the other Chinese Azaleas.—*Bot. Reg.* 1700.

COMPOSITÆ.

RHODANTHE MANGLESII, Captain Mangles's Rhodanthe.—A Charming Greenhouse Annual, with rose-coloured flowers, introduced from the Swan River Colony in New Holland, by Captain Mangles, Its season of perfection is May and June, at which time there is nothing in the gardens that equals it in beauty, for it possesses the brilliancy of the Cape Helichrysa, without their stiffness and formality. It requires to be treated as a tender annual, and to be kept in a cool greenhouse during its time of growth; too much heat seems to be particularly offensive to it.—*Bot. Reg.* 1703.

CLASS II.—PLANTS WITH ONLY ONE COTYLEDONE.

AMARYLLIDEÆ.

ALSTRŒMERIA AUREA, Golden-flowered Alstrœmeria. This species was imported by Mr. Anderson, from Chiloe. In habit it approaches nearly to *A. pulchella,* but probably will always be a much smaller plant.—*Bot. Mag.* 3350.

ORCHIDEÆ.

ORCHIS FOLIOSA, Leafy-spiked Orchis. A fine species, native of woods and copses in Madeira, very much like the European O. latifolia. It succeeds, either in well drained pots, or a turf pit, in a soil composed of the turfy portions of heath mould, with a mixture of moss and sand.—*Bot. Reg.* 1701.

ONCIDIUM AMPLIATUM.—Broad-lipped Oncidium. A very fine yellow' flowering species, first found in Central America by Mr. Cuming, and afterwards procured in a living state by Richard Harrison, Esq. Like all the rest of its genus, it requires the hot damp atmosphere of a stove.—*Bot. Reg.* 1699.

ARTICLE IX.

OPERATIONS IN THE FLOWER GARDEN FOR OCTOBER.

Auriculas.—In the beginning, if not done last month, these plants must be sheltered in a frame or brick pit, sunk or built two feet below the level of the ground. Cover the frame with wooden shelters, but give plenty of air in fine weather.

Camellias.—In the beginning of the month, the plants must be taken into the house or frame, or any other cool but sheltered situa-

tion, where they may remain till it is wished to bring them into flower.

Chrysanthemums in pots, should be removed into the greenhouse. Give abundance of air to keep them from drawing.

Calceolarias cut down, as recommended Vol 2 page 267, will now come beautifully into flower. Keep them in a cool, airy, situation in the greenhouse.

Cyclamens that were planted out in the open border, as recommended Vol. II, must be taken up and repotted when the leaves are well formed, and the pots set for awhile in a situation where they will receive a little heat; but when they have established themselves, and begin to show flower, remove them to an airy part of the greenhouse, or conservatory, to flower. If the roots were planted at first in pots, place them in a cold frame, or out of doors, until they have begun to form their leaves, when they may be placed in a warm greenhouse or frame, until they show flower, when they should be removed to a cool airy situation. Give abundance of air, and water judiciously.

Cactuses placed out of doors in June, should be brought into the greenhouse as early as possible, if not done before. Place them in a situation where they will receive plenty of light and air during winter.

Greenhouse Plants.—Not later than the first week, prepare to remove such as have stood out of doors, into the greenhouse. Clean and properly tie them previous to setting them on the stage. Give abundance of air day and night, but decrease it as the weather becomes colder.

Hyacinths may be planted in beds in a light dry soil, in rows, eighteen inches apart, and six inches from root to root in the rows. Or they may be planted in pots four inches deep, and three inches wide; put a little rotten dung in each pot, and fill up with light rich soil. Plant the bulbs so shallow, that nearly half will stand above the soil; plunge the pots in the open air, and cover them six or eight inches deep with rotten bark.

Dahlias.—In the beginning of the month, lay about three or four inches thickness of rotten bark or leaf mould over the roots, and for two feet round the stem of each plant: this is done to prevent the crown of the plant from being damaged by sharp and sudden frosts. When the tops are cut down, take up the roots, selecting, if possible, a dry windy day for the purpose: remove them to an airy situation till dry, and lay them on shelves secure from damp or frost, and cover them with dry sand or tan.

Forcing.—Plants intended for forcing, as Rhododendrons, Pinks, Carnations, &c., must now be taken up and potted.

Roses in Pots, if placed in the forcing house, will produce flowers about Christmas.

Ipomopsis, *Isotama*, and other handsome annuals, may still be sown in pots to flower the following May and June.

Primula prænitens.—May be propagated by cuttings in the beginning of the month. Take them off a little above the surface of the soil, and with a sharp knife cut off the bottom leaves, but by no means disturb the upper ones; plant them singly in small pots filled with equal parts of loam, peat, and rotten dung.

Tigridia pavonia, growing in the open borders, must now be taken up.

RURAL AFFAIRS.

ARTICLE X.—REPORT OF THE COMMITTEE OF THE DONCASTER AGRICULTURAL ASSOCIATION ON THE TURNIP-FLY,

AND THE MEANS OF ITS PREVENTION.

Founded on Returns received to the Questions of the Committee from 102 *Correspondents in different parts of England and Scotland.—8vo. Pamphlet, Pages* 89.*—Ridgway & Sons, Piccadilly, London.*

THE turnip crop, amidst all the improvements of Agriculture, has become of increased importance to the Farmer. As the first step in the course of cropping upon all light lands, the after crops in the same course are mainly dependant upon its success. If it succeeds, the eating off of the turnips, manures, and prepares the land for the barley crop, and succeeding seeds; whereas, should it fail, the chief support of the barley, and succeeding crop fails with it. Any injury therefore to the turnip crop, affects most seriously, the general course of management, and no pains or attention, should be spared to prevent it.

The insect, which is generally known by the name of the turnip fly, is one of the most formidable enemies which can attack a crop. As soon as the turnip plant appears above ground in its first and weakest state of growth, the insect fastens upon it. A few wounds from the smallest insect is then, too often, fatal to the plant; and the farmer may lose his season for a second sowing, whilst, doubting whether the first will sufficiently escape; or may encounter the same risk on a second sowing, by ploughing up the first, and bringing his land into a state less favourable for its general growth. If the young plant be finally destroyed, some less profitable substitute for that crop must be sought for, and the labour and expence of preparation for turnips is thrown away.

The enormous losses periodically occuring from the turnip fly, have necessarily led to enquiries after the means of prevention or cure. Many plans have been tried with partial success; and, from time to time, such plans have been published to the world as unerring remedies for the disease. A few years trial on an extended scale has, however, generally shewn, that such conclusions have been formed on too narrow an observation; and that particular circumstances of season or locality have produced the effcet, which had been ascribed to some general cause, applicable alike to all seasons and places without exception. Nothing but an extended observation, upon most of the varieties of soil, and through a course of varying seasons, can authorize confidence in any plan, upon a subject so complicated in its bearings; and no individual, however, wide his sphere, can be safely relied upon, as practically proving the sufficiency of the remedy. It will be seen that plans of prevention have been acted upon, under which individuals have, as they supposed, for a long series of years saved their crops; whilst the plan itself may eventually prove false in principle, and seemingly efficacious only from circumstances altogether foreign to it.

The course pursued by this Society, in obtaining the result of the experience of Farmers in different parts of the country, seems most adapted to the nature of the enquiry. The conclusions of practical men on all soils and under all circumstances are obtained; not only made during a few years, but extending through a long series of seasons: whilst the wide range of the enquiry seems to shut out the possibility of being misled by partially tried theories. An opportunity is also thus given of ascertaining the general practice as well as the opinions of intelligent men; and the certainty and safety of the one, is made a corrective of the inevitable vagueness and uncertainty of the other.

Upon the first head of enquiry—as to the seasons in which the depredations of the fly occur,—it appears that the greater number of correspondents state the months of May and June as the period of the first attack. It is, however, generally added, that their appearance occurs as soon as the turnip plant itself appears; and many correspondents have observed the insect upon the crops in April, whilst four correspondents have observed them in the gardens as early as March, upon garden sown turnips and cabbage plants.

On the second inquiry,—as to the stage of growth of the plant, in which it is subjected to the attack of the fly—the information is nearly unanimous. It is well known that as soon as the turnip plant appears, and puts out the two first leaves, called the cotyledon leaves,

it is immediately attacked by the insect; and, either by devouring these leaves, or the heart of the plant which developes the succeeding leaf, (or rough leaf,) it is generally destroyed. The smallness of the plant, and the extreme delicacy of its bud, leave it peculiarly exposed. It is, however, a general opinion, that after the second series of leaves, commonly called the rough leaf, are developed by the plant, that the insect will not longer attack it. This latter opinion is, however, unfounded. The correspondents, almost invariably state, that the insect continues its attack, and even commences its attack, though the rough leaf has appeared; but, that the rapid growth of the plant seldom fails, notwithstanding its aggressors, to insure its being brought to a crop.

The third head of enquiry was—how far the depredations of the insect were dependant upon the weather. The opinion of the great majority of correspondents is, that the fly is most to be dreaded in hot weather.

With regard to soils, the fourth head of enquiry was—whether any of the varieties with which this country abounds, are safe from the visits of the insect. On this point the correspondents agree, that no soils whatever, on which turnips can be cultivated at all, are safe from its natural enemy. On strong lands as well as light lands, on hot soils as well as cold, the turnip fly will be found.

On the fifth head of inquiry—how far the use of particular kinds of manure may affect the appearance of the insect—it seems to be ascertained, that no manure at present known, will prevent its approach; but that, whatever manure may be used, the fly will not avoid it. Apparently dwelling upon this fact, many of the correspondents assert, that it makes no difference what manure is used; but the observation of others—and by far the greater number—brings them to the conclusion, that whatever manure most effectually promotes the growth of the plant, that will at the same time, be the most effectual defence from the insect.

As to the benefits with reference to the turnip fly, arising from particular methods of cultivation—which comprises the sixth head of enquiry—something is necessary to be said. It was made a distinct question in the Circulars, whether the broadcast or drill system was most safe from the fly, and the answers have been, what might have been anticipated, most overwhelmingly in favour of the drill system.

We must now turn to the most difficult part of our enquiry—the natural History of the Insect. Mr. Henderson states, "The insect commonly known by the name of the turnip fly, is Haltica nemorum, it belongs to the order Coleoptera, and is, therefore, not a fly,

but a beetle. There are thirty-eight species enumerated by Samouelle, a great many of which feed on plants belonging to the order Crucifera. They are seldom seen on the wing; but, from the peculiar structure and great strength of their hinder legs, they can leap a great distance. Haltica nemorum is one of the smallest of the British species, and under that name are included two very distinct varieties, one with white longitudinal lines on the Elytræ, and the other which is perfectly black. In every turnip field you will find some of both varieties." Mr. Westwood states, "the turnip fly belongs to an extensive family (Chrysomelida, or Golden Beetles) and as it is nearly related to some of the small species of Chrysomelida, whose habits are recorded, I think we are justified, from analogy, in judging their habits are precisely similar."

With regard to the changes or metamorphoses, under which the turnip fly passes before attaining its perfect state as turnip fly, Mr. Westwood says, "Like all beetles, they have previously undergone a succession of changes, through the egg, grub, and chrysalis state; which occupy a considerable time before the insect arrives at its perfect state as a beetle:—not, indeed, several years, as is the case with many beetles; but, I am inclined to think, at least, one year. If this be the case, it is evident the preparatory stages of the insect are not connected with the young turnip." Dr. Pearson is also of opinion, that the fly has passed through the stages of egg, grub, and chrysalis, before appearing in its most dreaded form, as the destroyer of our turnips. So also says Mr. Henderson; and they all state it as a fact, of which, judging from analogy, no naturalist can entertain a doubt.

It is, however, very remarkable, that no entomologist has detected the insect in any other state than the perfect one of fly or beetle. If the transformations take place, which, by analogy, we are fully warranted to expect, they are so carried on as hitherto to have escaped detection. This part of our enquiry is, by far, the most important; and, important as it is, cannot, in the present state of information, be fully answered. Dr. Pearson, who appears to have given great attention to the subject, says, "I once thought the white specks or dots observable on a large portion of turnip seed, (say, three out of five,) were the eggs of the chrysomelœ, or turnip fly, deposited on them by the fly, at the time when the turnip seed ripens and bursts, so as to give the fly an opportunity of getting at the seed. But I have since been compelled to abandon this opinion, having had no flies when the seed was sown in soil contained in pots covered with bell glasses —the soil had no manure mixed with it." Mr. Westwood also, after

every enquiry, states, he has not discovered any of the previous transformations. Mr. Henderson, after having kindly undertaken experiments, states, "I have not been able to discover anything, myself, which can be satisfactory to the committee; I have applied for information to several entomologists, who, if any discovery had been made on the subject, would most likely be acquainted with it; their answers were all to the effect that no discovery had been made of the egg, the larvæ, or the pupæ of the insect, or of its transformation from one stage of its existence to the other. This is the substance of the answers which I have received from Mr. Dale, of Glanville Wotton, Dorset—a gentleman who has made many valuable discoveries in entomology—and from Mr. Curtis, author of British Entomology, and a very high authority on matters relating to the science."

Under these circumstances, all speculations as to the abode and habits of the infant turnip fly, must be vague and unsatisfactory. The gentlemen above named seem strongly to doubt whether, in these earlier stages, the insect is at all connected with the turnip field. We need not say how very important it is that these facts should be ascertained, and that we should know where the enemy is generated and nurtured, as well as the length of time occupied in each transformation. An extensive series of experiments undertaken on this subject, might be of the utmost advantage, and eventually prove a national benefit. It is possible, that, in its infant stages, the insect may be destroyed, more effectually than in any other; and, at all events, an accurate knowledge of these facts would confine the efforts and experiments of the Farmer within certain lines, from which they must now, in our ignorance, be continually diverging; and much time and effort, now wasted on impossible experiments, would be saved.

That the turnip fly passes the winter in a torpid state, and revives on the approach of spring, is ascertained beyond a doubt. Mr. Henderson states, "I examined a great number of trees, in various situations; in the wood, in the plantations, and standing singly; and from trees in all these situations, I obtained Haltica nemorum in a dormant state. They are found on those trees which have a very rough outer bark, and lie underneath the bark, where it has become partially excoriated, generally two, three, or four together, perfectly dormant, but when held in the hand, or taken into a warm room, they revive and leap about. The number which may be found by a diligent search in the middle of winter is, I believe, much greater than is admitted, even by those who are aware of their hybernation. I took from a horse-chesnut, standing in an exposed situation, in the middle of January, twelve Haltica nemorum; and it is probable, that

more than twice that number might have been found higher up the stem, and among the branches of the tree." Other Correspondents also state the fact of its being found in winter. Mr. Willey states, "In 1825, in the month of January, I was engaged in a turnip field, when one of my sons, who was trimming a hedge called to me, and shewed me an immense number of the turnip fly, in a state of torpidity. They were lodged in the shattered part of the old stock, from which the thorns had been cut a few years before. We examined several other parts of the hedge, and found almost every crevice, where the thorns had been shattered, completely full of them. I took a quantity of them home, in order to shew them to my neighbours, and when they were brought to the influence of heat, they became quite lively, and hopped away, apparently with as much strength and vigour as in the month of July."

A striking instance of the manner in which these insects will increase when left undisturbed and provided with shelter, is given by Mr. Berry; "about eight years ago, (he writes) I cleared for cultivation a piece of ground, which had probably for centuries been woodland; and was, when I commenced operations, covered with decayed stumps of trees, bushes, and rank weeds. Having been drained, it was well worked and limed, and planted with hops and intermediate rows of cabbages. When the latter were about a foot high, they became covered and ultimately destroyed by myriads of turnip flies, which literally blackened the leaves. Having consumed the cabbage, they attacked and destroyed the young hops. In the cultivation of the same land, during subsequent years, this did not again occur." The inference which Mr. Berry draws, and in which he seems warranted, is, that the abundance of shelter and vegetable matter always previously found on the spot had produced that wonderful quantity of flies; but that clearing and cultivation depriving them of food and shelter, destroyed or drove them away. This is a a fact greatly encouraging, as implying the general decrease of the insect on clean well cultivated land.

Much upon the general habits of the Insect will be gathered from what has preceded. "In its food, (as Mr. Henderson remarks,) the turnip fly seems to prefer the common turnip to all other Vegetables, horse radish, perhaps, excepted; and, as soon as the plants come up, they attract all the flies in the immediate neighbourhood. I observed, last Spring, that many cruciferous plants, on which they had been feeding, were deserted as soon as the turnips came up; and they have continued to reside on the turnip plant ever since, although their leaves are old and stiff, and although cauliflower, cabbage, and other

sorts of greens are growing all around them." They are also to be found, throughout the Summer, in grass fields, and indeed, in all fields where vegetation is found. Mr. Henderson says, "there are always great numbers of these insects to be found throughout the Summer among the grass; with a net, such as is used for catching coleopterous insects, thousands of them may be caught any fine evening from May till October, by merely brushing the tops of the grass." Mr Godfrey Wright states, he has found them amongst the wheat crops whilst weeding. Dr. Fleming also states, they are found in oat and barley fields, and feed upon the wild mustard and wild radish. There can be no doubt but many other wild growing plants form the food of the insect, and that it is not dependent upon the cultivation of turnips for its food.

Mr. Henderson has also found that the insect, after arriving at its perfect state, increases considerably in size: those, which he observed for a length of time upon the turnips in the garden, were, in August, much larger than when they first appeared; and considerably larger than those, which in the same month, were to be found in the grass in the park. The latter were of various sizes, but the greater number of them very small. This leads him to the conjecture that the insect may be bred amongst grass.

In the Entomological Magazine for July, 1833, is an article signed—"Rusticus" and dated at Godalming, in which experiments are detailed to prove that the insect is produced from an egg deposited on the seed of the turnip. The writer dates his experiments so far back as 1823, and that his subsequent experience has confirmed his opinions. *See Hort. Reg. Vol.* 2 *page* 377.

No opinion is more common than that the insect springs immediately from an egg into a perfect fly; and that the exposure of the egg, by ploughing and working the land, is the more immediate cause of its vivification. Upon this hypothesis Mr. John Sutton, of near Salisbury, adopted the plan of preparing the fallows for the seed, and leaving the land for ten days or a fortnight before sowing; in which time he concluded the fly would be hatched and die for want of food. This plan he, after trial, published in a pamphlet, and it has obtained considerable celebrity, and has still many partisans. In our returns its success is in many instances stated; although in others also its failure. But it is certain, some considerable measure of success must have attended the plan, whatever opinion may be held of the hypothesis upon which it was founded. The eligibility of the plan will be hereafter considered; but, as far as it bears upon the natural history of the insect, we must here remark, that it can by

no means be considered as establishing the fact of the immediate production of the perfect fly from the egg. If the insect be supposed to be vivified by exposure of the earth to the sun, it may be from the chrysalis state. If the chrysalis lie in the earth, its exposure would speedily produce the perfect fly; and the fly may still have gone through the transformations which entomologists predicate. This suggestion of our own is, however, mere suggestion—hypothesis to meet hypothesis. Neither Mr. Sutton nor his followers state an actual observation of the production of the fly immediately from the egg; and the partial success which has attended the plan, may have arisen from other causes altogether foreign. Supposing even Mr. Sutton's hypothesis to be correct, it is clear that as the insect abounds in every field around in a perfect state, and its powers of motion are so great, it will not be prevented moving upon the turnip field; though it should be so strewed with the carcases of its famished brethren, as to present the appearance of an insect charnel house."

The following are a few practical directions drawn from the information they have gained.

1. That, most effectually to insure the speedy growth of the plant, the land should be kept in the best possible state of cultivation.

2. That scuffling or ploughing the land before winter, and clearing the hedge bottoms, and every other place which can harbour the insect, should be systematically attended to.

3. That the fallow should be completed as early as possible, so as to give an opportunity for choosing a favourable season for sowing.

4. That the system of ridging the land, with manure under the rows, and drilling on the ridge, be in every possible case adopted.

5. That the most favourable opportunity for ridging be chosen; particularly that the land be not ridged in too dry a state.

6. That as soon as the land is opened for the manure, it be laid in —the ridges formed, and the seed drilled immediately. The quicker these operations follow each other, the better chance of the crop.

7. That the manure chosen be such as will be adapted to the soil, and insure the speediest growth of the young plant, and that a full quantity be allowed.

8. That the seed be not deposited in the manure, but the manure be thinly covered with soil, and the seed drilled in this soil.

9. That a very liberal allowance of seed be given, as much as three or four pounds per acre, for drill, and six or seven for broadcast, and that this seed be of one year's growth.

10. That as soon as the plant appears above ground, it be dusted

with quick lime, and this repeated as often as rain or wind beats it off and the fly re-appears.

11. That in places which suit, and in seasons particularly dry, watering by a watering machine be resorted to.

Under these precautions, the Committee confidently trust, that the loss of crop from the turnip fly, may be, in most cases, prevented.

The whole concludes with an appendix containing the analysis of the returns of each of the 102 correspondents.

The Committee request any Gentleman who may have made any observations on the turnip fly to communicate with them through their Secretary, Robt. Baxter, Esq.

The Report, we think, is of immense importance to farmers in general, for although the Natural History of the insect is still in a great measure left in obscurity, yet many things are brought together which in a little time may be the means of leading to the most important results. At all events, the observations recorded in this pamphlet go much further than any thing of the kind ever before published.

NATURAL HISTORY.

ARTICLE XI.—A FEW REMARKS ON THE STRUCTURE, DISTRIBUTION, CLASSIFICATION AND UTILITY OF PLANTS;

Being the Substance of Four Lectures delivered before the Sheffield Literary and Philosophical Society.

BY G. T. BURNET, ESQ, PROFESSOR OF BOTANY, KING'S COLLEGE, LONDON.

PLANTS are scarcely separable from animals, no absolute character being yet known by which they may be distinguished from each other with certainty. One great cause of disparagement to the study of this delightful branch of Natural Philosophy has hitherto been to the unlearned, the alarming prospect of having to learn such a numerous assemblage of hard names; and to the learned, the common error of resting in the attainment of the nomenclature, as if the end of the science was merely or chiefly knowing the class and order to

which a plant belonged in the Linnæan or Jussieuean systems. In a science like Botany, some sort of Terminological arrangement appears essential to system. The whole of the Vegetable Kingdom, from the difference of their habits and constitutions, may be classed as plants belonging to three great *regions*. The plants in each of these regions may be divided into three distinctive groups, which may be again subdivided into three Orders each, thus making in the whole 27 Orders.

The description of vegetation in its most comprehensive sense may be designated by the term Botanographia, and the regions may be designated with reference to the three great varieties of plants, as follows:—

1. CRESCAFFINES, or those plants which increase indefinitely, and sometimes attain a great age, as the oaks of this country, the cedars of Lebanon, and many others.

2. TERMAFFINES, or those trees which only live until a certain peculiarity of their organization is accomplished, and which then blossom, bear fruit, and decay as palms, &c. &c.

3. MYCAFFINES, or those plants which have merely a cellular tissue, &c.

The scientific investigations of these regions are indicated respectively by the terms,—Mycologia, Termologia, and Crescologia, each term including three distinct classes, as follows:—

- Botanographia.
  - Mycologia.
    - 1. *Algologia.* Timestain, Flags, &c.
    - 2. *Fungologia.* Mildew and Mushrooms.
    - 3. *Muscologia.* Mosses and Liverworts.
  - Termologia.
    - 4. *Filicologia.* Ferns, &c.
    - 5. *Graminologia.* Grasses, Sedges.
    - 6. *Palmarologia.* Palms, Lilies, &c.
  - Crescologia.
    - 7. *Pinarologia.* Pines and Zamias.
    - 8. *Rosarologia.* Roses, Pulse, &c.
    - 9. *Selanthologia.* Selworts.

These nine Primary Classes are represented under the arrangement of Linnæus by the following groups.

Vegetabilia.	Fruges.	1. *Palmæ.* Principes.
		2. *Gramina.* Plebii.
		3. *Lilia.* Patritii.
	Plantæ.	4. *Herbæ.* Nobilis.
		5. *Arboreas.* Proceres.
		6. *Filices.* Novaco ll.
	Cryptogamia.	7. *Musci.* Servi.
		8. *Algæ.* Vernaculi.
		9. *Fungi.* Nomades.

1st *Palmæ* Palms. These from their noble growth were called by Linnæus Principes, or Princes of the Vegetable World. The size and appearance of some of these noble trees, may be partly conceived by imagining a stem * growing straight, and branching to the height of 100 or 150 feet, and spreading from the top of this vegetable column, thirty or forty vast leaves, of fourteen feet in diameter! This class of plants differ exceedingly in the principle of their growth, from the timber and other trees with which we are familiar, resembling more the bamboos or grasses, being hollow at the commencement of their attaining full size, and afterwards filling up in the inside towards the centre, instead of receiving successive depositions, layer on layer on the outside, as is the case with all timber trees. On account of this peculiarity, Palms and other plants of like formation, are called *endogenous*, or inside growers, whilst the others are denominated *exogenous* or outside growers. Endogenous plants continue to fill up the hollow stem until there is no more room for them to grow, and as in the case of the Talipot Palm, and some others, they flower and die.

* The stems of Palms have, by some writers, been considered as an extended cormus, and not a true stem, but this seems an extravagant application of the term; or rather an application which reduces the signification of the term to nothing. A cormus is a depressed subterranean stem of a particular kind: the trunk of a Palm is, as far as its external character is concerned, as much a stem as that of an Oak.—DR. LINDLEY *Int. Bot. page* 55.

2. *Gramina,* Grasses.—These important tribes afford three-fourths, or four-fifths of the food of all nations. They were called by Linnæus, *Plebii,* or Commoners, because if not the most ornamental, yet amongst the most useful members of the vegetable community.

3. *Lilia.*—The beautiful group of lilies, &c. were called by Linnæus *Patritii* or Patricians.

4. *Herbae,* or herbs, were called Nobiles, or Nobility.

5. *Arbores,* or Trees, he distinguished as Proceres, or Notables.

6. *Filices,* or Ferns, were called Colonizers, because they are the first of the higher orders of the Vegetable Kingdom, which are found naturally growing upon spots occupied only by some of the succeeding grades. Their propagation is not by seeds, but by little bodies called Sporules, inclosed within cases named *thecæ;* the whole having the appearance of a kind of dust produced on the back of the fronds, and which is so light, that it is easily carried by the winds from one place to another, to incredible distances.

7. *Musci,* Mosses.—The numerous tribes of this interesting family are very appropriately called *Servi,* or Servants, from the important offices they perform in the world. They form soils on the most barren rocks, by the decomposition of many successive generations, until it becomes of a sufficient depth to support the higher orders of Vegetation; when man comes with his implements of culture, and ventures to claim the soil as his own. Water mosses purify the water in which they grow, by absorbing the putrescent substances with which it may be corrupted, and by exhaling oxygen in exchange. These plants are also increased by sporules, contained within an urn, placed at the top of a stalk, bearing on its summit a kind of loose hood called a calyptra, and closed by a lid. When the fructification is more advanced, the lid falls off, and the seeds are then kept in by means of a set of teeth or a fringe, placed around the mouth, which open in wet weather, and allow the seed to escape.

8. *Algae,* Sea-weeds, &c. These were considered by Linnæus as *Vernaculi,* or Bond Slaves, because although they are attached to certain matters, they derive no nourishment from them, but subsist chiefly, if not wholly, by atmospherical inhibition. The sea weeds are called flags, because when taken out of the water they flag or droop. These plants may be seen in their simplest state in the form of a green slime on the surface of stones exposed to constant moisture, on shady walls, and damp walks. Algæ in a state of higher organization clothe the rocks in the sea, where they form forests of considerable extent; and grow to an amazing size; the Chorda filum being frequently found thirty or forty feet long; and the Macrocystis

pyrifera from 500 to 1500 feet in length. Algæ were formerly supposed to be produced naturally in the water by congelation. They purify the water in which they grow, converting what would be a nuisance, into wholesome drink. They are increased by sporules, which may be divided to an almost incredible degree.

9. *Fungi,* Mushrooms, &c. called by Linnæus Nomades, or Wanderers, from the apparent capricious and diversified selection of the places of their growth. The structure of these plants, is more simple than that of Algæ, consisting of little else but cellular tissue. They are increased by sporules, which are so numerous, that in a small piece of smut, not larger than a pin's head, there have been found no less than six millions of sporules, and in a single individual of Reticularia maximum, Fries counted above ten millions, so subtle as to resemble thin smoke.—*Lecture* 1.

Aug. 24th, 1834. *(To be continued.)*

MISCELLANEOUS INTELLIGENCE.

ARTICLE XII.—REMARK AND ANSWER.

THE EDITOR *of the Gardener's Magazine on the subject of the Bygrave Plant Preserver.*—In number 39, of the *Horticultural Register,* page 407, you assert that figure 17, page 37, Vol. viii. of the *Gardener's Magazine,* is the Bygrave Plant Preserver, figured in Vol. I. p. 151 of the *Hort. Reg.* though it is expressly stated in the *Gard. Mag.* that it is figured from a specimen sent to me by Mr. Allardyce. In reply to this unwarranted assertion on your part, I beg leave to state that the pan, from which my figure was taken, is still in my possession. It was sent to me by Mr. Allerdyce, a potter, and brickmaker, in the neighbourhood of Aberdeen, a gentleman, who has contributed several other articles to the *Gardener's Magazine.* I received the pan in question, April 28th, 1831, (before the Hort. Reg. was commenced,) as my Register book will prove, though absence from home, and other causes, prevented me from inserting a figure of it for some time afterwards.

I think it proper to state these particulars, and to request you to give them publicity, in justice to Mr. Allardyce, whose friends might otherwise think that I had taken an unjustifiable liberty with his name. J. C. LOUDON.

Bayswater, Sept. 2, 1834.

If the above statement had been made in the *Gardener's Magazine*, Vol VIII, page 37, when the figure of the pan was inserted, we should have had reason to suppress the assertion made in our Register page 407, but as the figure appeared in our work in October, 1831, and in Mr. Loudon's, in January, 1832, there was time sufficient to have pans made from our pattern, by any gentleman who might choose to send one for insertion in the *Gardener's Magazine.* With regard to the dependence to be placed on assertions made in the *Gard. Mag.*, we have only to refer the readers of it to Vol. X, page 231, on the subject of Jesse's Mode of Planting Trees, and to our answer to the same, Hort. Reg., page 407, of the current Volume.

T. HARDCASTLE PRINTER, CHURCH-STREET, SHEFFIELD.

THE HORTICULTURAL REGISTER,

NOVEMBER 1ST, 1834.

HORTICULTURE.—ARTICLE I.

A MODE OF CULTIVATING AND PROTECTING FRUIT-TREES.

BY MR. JAMES EATON,

Gardener to the Earl of Ilchester, Melbury, Dorsetshire.

I BEG to state to you my method of protecting and preserving the fruit-trees under my care, if you think it worth notice. It will give me no small degree of pleasure to be in any way useful to the readers of the *Horticultural Register*.

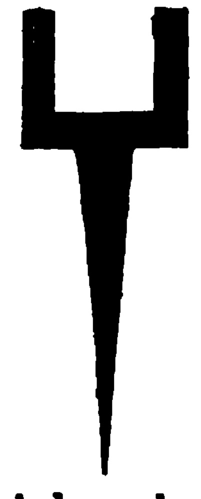
In the year 1808, I finished making a new garden for the Earl of Ilchester, at Melbury, in the county of Dorset. The borders were all composed of fresh maiden loam, three feet deep, and twelve feet wide, well drained, and paved at the bottom. In these borders, I planted a number of Peach and Nectarine trees, which I suspected would do well. The first two or three years after planting they did middling, after which they began to canker, and become naked at the bottom; I then planted most of the borders again with trees brought from different soils; these did no better, and in a few years all required planting again. I changed the soil, and tried every method I could think of, but with no better success. At last I thought it must be cold that checked the rise of the sap in the spring; and I have since adopted, with success, the following method:—I have all my Peach and Nectarine trees covered every night, from the first year they are planted, commencing as soon as the buds begin to open, and continue the same until the middle or end of May. This I do by means of a mat, whilst the trees are small, and round the body of each tree I stick small boughs of evergreens, as Portugal laurels, &c. which I allow to stand until all apprehension of cold is over.

About the beginning of February, I have every part of the trees unnailed, and well washed with a paint brush, in every part, with the following composition; soot, quick-lime, scotch snuff, and sulphur

vivum; one pound of each, put into a large waterpotful of soap-suds and urine. I let it stand for two or three days, occasionally stirring it up during that time, and then it is fit for use.

By this treatment, all my trees do as well as I can wish. I find the wash is a great preservation to the trees from the attack of insects; and it causes the trees to look as green the summer after it is applied, as a pasture-field looks the summer after it has been dressed. I recommended the use of it to a neighbouring gardener, and during the time of the operation, his employer advised him to be cautious how he made use of it, unless he was better acquainted with it. He left off at once, and in the following summer any person could see across the garden how far the trees were done, for the part dressed looked a dark green colour, while the other part assumed a yellowish colour. I have not, at this time, an unhealthy tree in the garden (and this last spring was a trying one for fruit trees, my plums suffered much that were not covered,) and I have had this season the finest crop of Peaches and Nectarines I ever had in my life.

When the trees become too large to be covered with a mat, I have curtains made to cover the whole of two south walls and some east walls. The curtains are made of strong canvass, it costs about fourpence per yard; I have four breadths sewed together, which make one curtain, I have them nearly to the coping, and about eighteen inches from the ground. I draw them sideways like bed-curtains, which I consider much better than hoisting them with lines and pullies. I have nine rings sewed on with strong tape to the top, and also to the bottom of each curtain, and in one or two places between the top and bottom of the curtains, which keeps them from being much strained by the wind. A piece of tape is sewed on where the rings are fastened, to strengthen the curtain, and the rings run upon small iron rods like bed-curtain rods, fixed into studs made of deal or fir, about two inches and a half square, which are made moveable. First, I have irons drove into the wall like the annexed figure, one near the top and another near the bottom, to fix the studs into; the top one projects six inches from the wall, and the bottom one nine; there are holes in the irons for iron pins (each with a head) to go in and through the stud, which keep it quite firm. The curtain-rods are made with a head at one end, and a screw at the other; holes are made in the studs to slip the rods through, then a nut is put on the screw which keeps all tight; the curtains have a sheath or pocket at each side similar to the under vallance of a bed, to admit a lath of about two inches by three-quar-



ters of an inch, one serves to draw the curtain backwards and forwards. These laths are great strengtheners to the curtains during rough winds, for till I used the laths, the curtains were often rent at the edges. Loops of tape are sewed at three or four places at the sides of each curtain, to slip over nails in the studs to keep them from being destroyed by the wind. I neither use line nor pulley, and the whole may be drawn or undrawn by one person in fifteen minutes.

At the distance the studs stand from the wall, the sun is admitted to shine under, when the curtains are undrawn, so that no part of the tree is shaded to hurt. At the top of the studs, just under the coping, I have a sort of weather-board, about nine inches wide, tacked on to protect the trees from perpendicular frosts. I keep the studs, rods, irons, and weather-boards all well painted, and when not in use all are packed away in a dry place except the irons, which remain fixed in the wall, and all except the curtains will last nearly as long as the wall. I have a bit of lead with a number stamped upon it, which is nailed to each stud, and a corresponding one is nailed to the wall, so that every stud is easily carried and fixed to its own place without difficulty; the curtains are all made exactly of a size, and so will fit any part of the wall.

I have found the curtains of great use, to cover green-gage and other plums, just before they are getting ripe, to draw over the trees in heavy rains to prevent their cracking.

September 11*th*, 1834.

ARTICLE II.—CULTURE OF THE MELON,

As Practised by Mr. Forbes, at Woburn Abbey, extracted from the Hortus Woburnensis.

THE Melon and Cucumber plants, bearing a strong analogy to each other in their growth, require but little variation in their general treatment. The former being of a less robust nature, it is with more difficulty that a stock of healthy plants can be procured in the gloomy winter months; frequent sowings are consequently made at various periods in January and February, in order to secure a stock of plants, which should be raised in a seed bed previously prepared for the Cucumber. When the plants have attained the height of two to three inches, with their seed leaves almost fully developed, they should be pricked out into pots about four inches diameter, placing three in each, as some of them will be liable to damp off; but when the season is more advanced, two plants in a pot will be sufficient. When the first or second rough leaf bursts forth, the plants should be stop-

ped at the first or second joint, which will be the means of strenthening them, and induce lateral branches to push out from the centre of the plants. While they are nursing in the seed bed, the department in which they are intended to produce their fruit must be got in readiness, and prepared according to the directions specified for the Cucumber beds; and when the burning heat has subsided, the mould may be spread over the surface of the bed, and frequently turned for a few days, so as that every part may become dry, and got into a congenial state for the reception of the plants. The soil that appears best adapted for the growth of the Melon, is the top spit (with the sward intermixed with it) of a pasture, that consists of rather a strong yellow loam, a few months previously prepared, well chopped up, and turned two or three times before it is used.

When the soil in the frames is thoroughly warmed through, and collected into hills under each light, the plants may be put in, turning them carefully out of their pots, and keeping them as close to the glass in the first instance, as they will admit, as the fermenting substance will soon subside; and if not well prepared and trodden, it would leave the plants at too great a distance from the glass. After planting, a little aired water is given, to settle the soil about the roots. The lights must be now well covered during the nights, and the temperature in the frames not permitted to fall below 66 degrees with artificial heat, and from 80 to 85 degrees with sun heat; but when air can be freely admitted, the temperature must be increased 8 or 10 degrees. The exterior linings of dung must be well attended to, so as not to let the heat get too much exhausted before they are renewed with additional dung. A little fresh air should be given at all favourable opportunities, and the interior of the frame kept in a sweet and healthy state, otherwise the plants will make but little progress.

When their Vines begin to extend themselves, they must be kept pegged down to the surface, and a little fresh soil added progressively to the hills, before the entire bed is moulded over to the depth of a foot or fourteen inches, which will be of sufficient thickness for the nourishment of the Melon plant. It is necessary, also, to be careful in watering the Melon; for if much is given close to its stems, it will be subject to canker and rot off before the crop of fruit is ripened; therefore the water should rather be applied to the extremities of the roots than to the centre. Care should likewise be taken not to injure or break the foliage, and to avoid wetting the incipient fruit and blossoms as much as possible. In short, while the fruit is setting, water should be almost suspended. At an early period of the year the im-

pregnation should be assisted, as will be directed for the Cucumber. The Melon, being a plant rather impatient of much lopping, the Vines should be spread out thinly at the first arranging of the shoots, and the knife but sparingly used until the first crop is ripened off, only thinning out the weaker and unproductive Vines. But as soon as the fruit is gathered, it should have a thorough pruning, cutting away all the weak and unhealthy shoots, and shortening back those that are to remain to the most promising joints, which will push out strongly, and may produce as good or even a better second crop than the first. The heat of the beds will require to be kept up, by the exterior linings of dung, until Midsummer, when if the weather is at all favourable, the effects of the sun will keep the internal atmosphere of the beds sufficiently high, and the linings may be dispensed with. For succession crops, there must be additional beds prepared monthly, until the middle of June, when the last planting may be made for the latest crop of Melons; the beds that are prepared in the latter months, will not require to be so strongly built as those which were made up at an earlier period of the year.

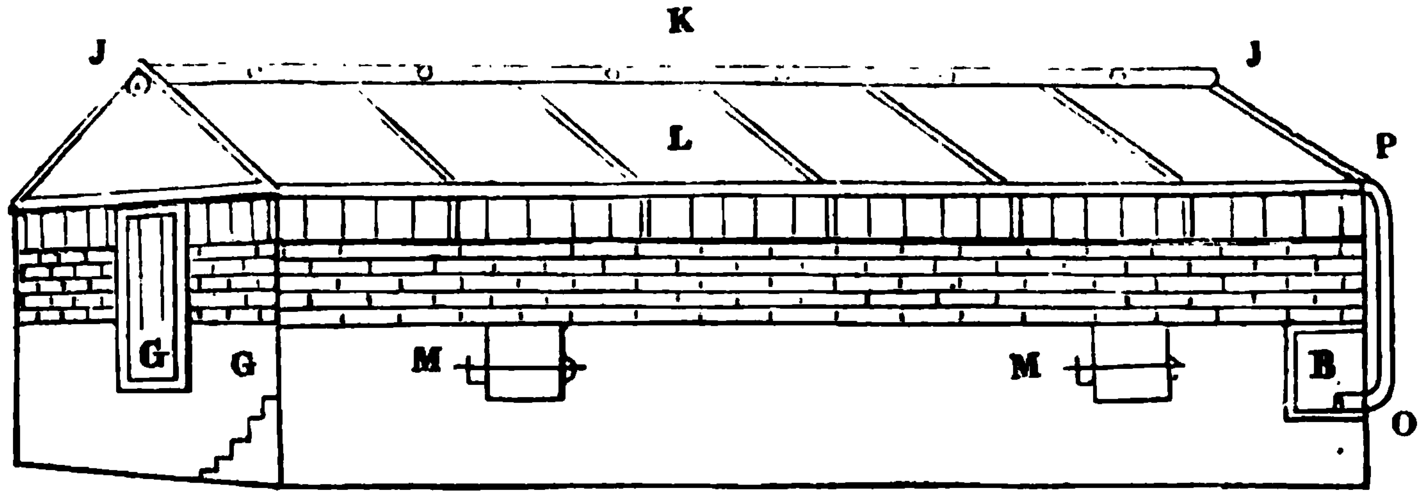
ARTICLE III.

PLAN AND DESCRIPTION OF A NEW FORCING-PIT.

BY MR. W. MATHERS.

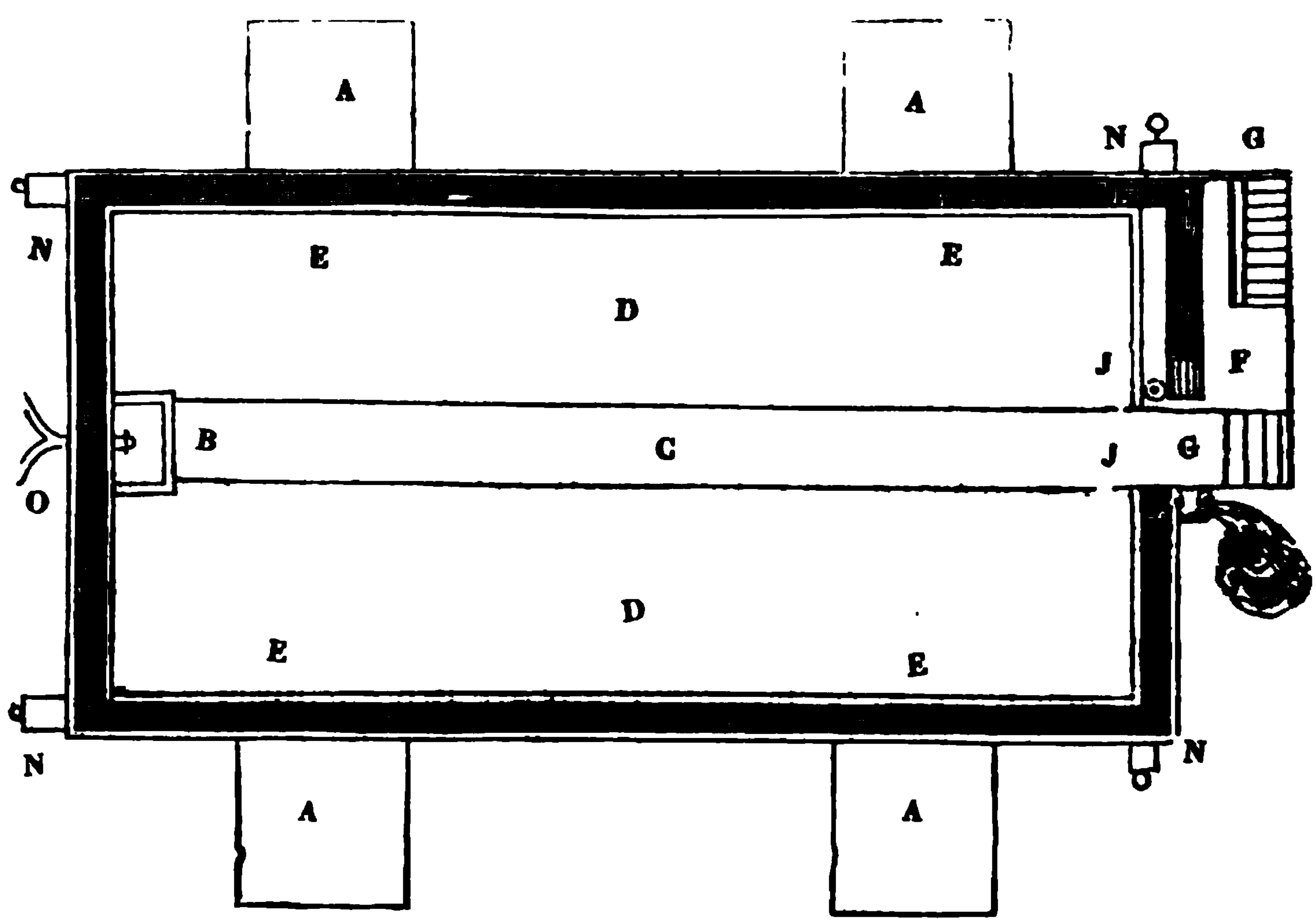
I SOLICIT your attention to the enclosed Plan of a New Forcing-Pit, (fig. 32) which I have proved, with the exception of the position of the Roof. The chamber in which the dung is placed is 4 feet deep being about 18 inches below the surface line, the walls which surround it are 9 inch brick work, on both fronts are two openings 2 feet 6 in.

32



square marked M, each with moveable doors through which the dung is introduced, the doors fit at top and bottom into a groove and fastened across with small wood bars into one round and one open staple as marked. In front of the doors is a small area marked A, sunk in

the ground, surrounded by a wood curb, by which the introduction or removal of the dung is performed. The pit is erected North and South. Through the centre of the pit is a walk 2 feet in width marked C, including the parapet walls; at the south end of the walk is a cistern 2 feet square, marked B. The parapet walls are single brick, the height 6 feet, including the curb; the walk is raised 2 feet for the convenience of reaching over the walls to do what is necessary. The supporters of the bed are cast iron bars, 20 inches apart, with a ridge in the middle on which slate or tile is placed, bedded in lime morter, so that any racid dung may be used without injury. A small fire flue marked E, is carried round above the dung chamber; at the north end above the furnace is a ventilater marked J, for rarifying the air. Through the centre of the pit is a small tin pipe, marked K, fixed to the top full of small holes, with a ventilator at each end,



also marked J, for the condense air to pass off, a set of small sashes marked L, 1 foot deep for the admittance of more air when necessary, hung with joints at the top. The bottom convenience are small iron bars, with holes, *as in use*, the depth of soil from 20 inches to 2 feet upon the slate or tile; the walk may be considered a loss, but when considered by a professional Gentleman will no doubt appear very advantageous. The plants are to be trained up under the glass and over head, the steps into the shed are marked G; the letter P is a small spout to receive the water from the roof to which is attached a lead pipe marked O, to conduct the said water into cistern B. The letter I, are the steps into the walk, the letter F furnace, N, the plugs for the convenience of cleansing the flues.

The plan of this pit is adapted for early or late forcing; in consequence of the construction, it is equally adapted for Winter as Summer. By the advantage of the ventilators in carrying off the condensed air, the advantage derived by the door being at the North end, we have no loss of top heat, as is too frequently the case in common framing. The dung chambers may be appropriated to forcing Seacale, Rhubarb, and Mushrooms in pots or boxes.

ARTICLE IV.

PLAN & DESCRIPTION OF A MODE OF HEATING BY HOT-WATER,

As Practised at Olive-Mount, Wavertree, near Liverpool, the Seat of J. T. Crosby, Esq,

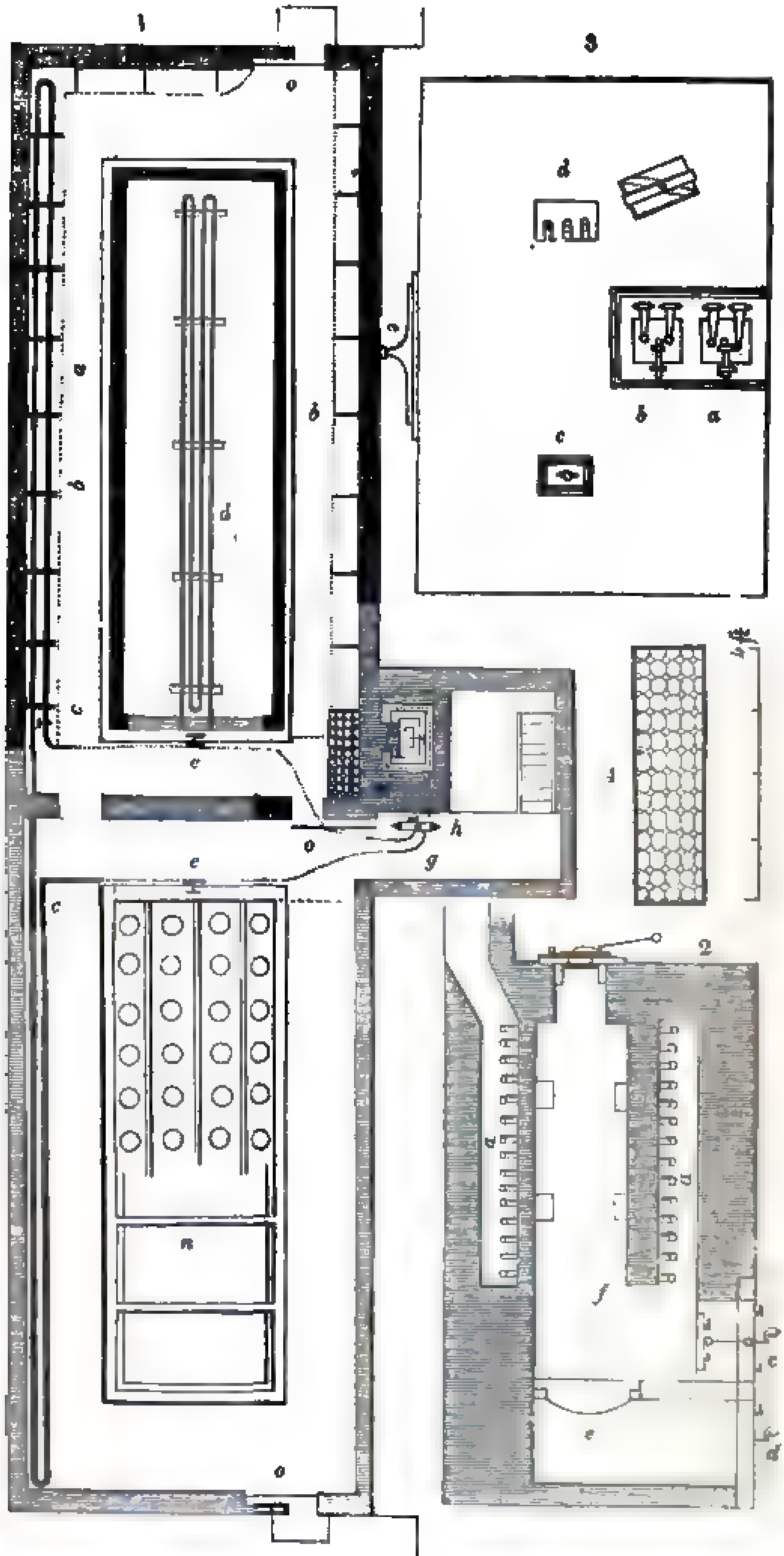
BY MR. GEORGE USHER.

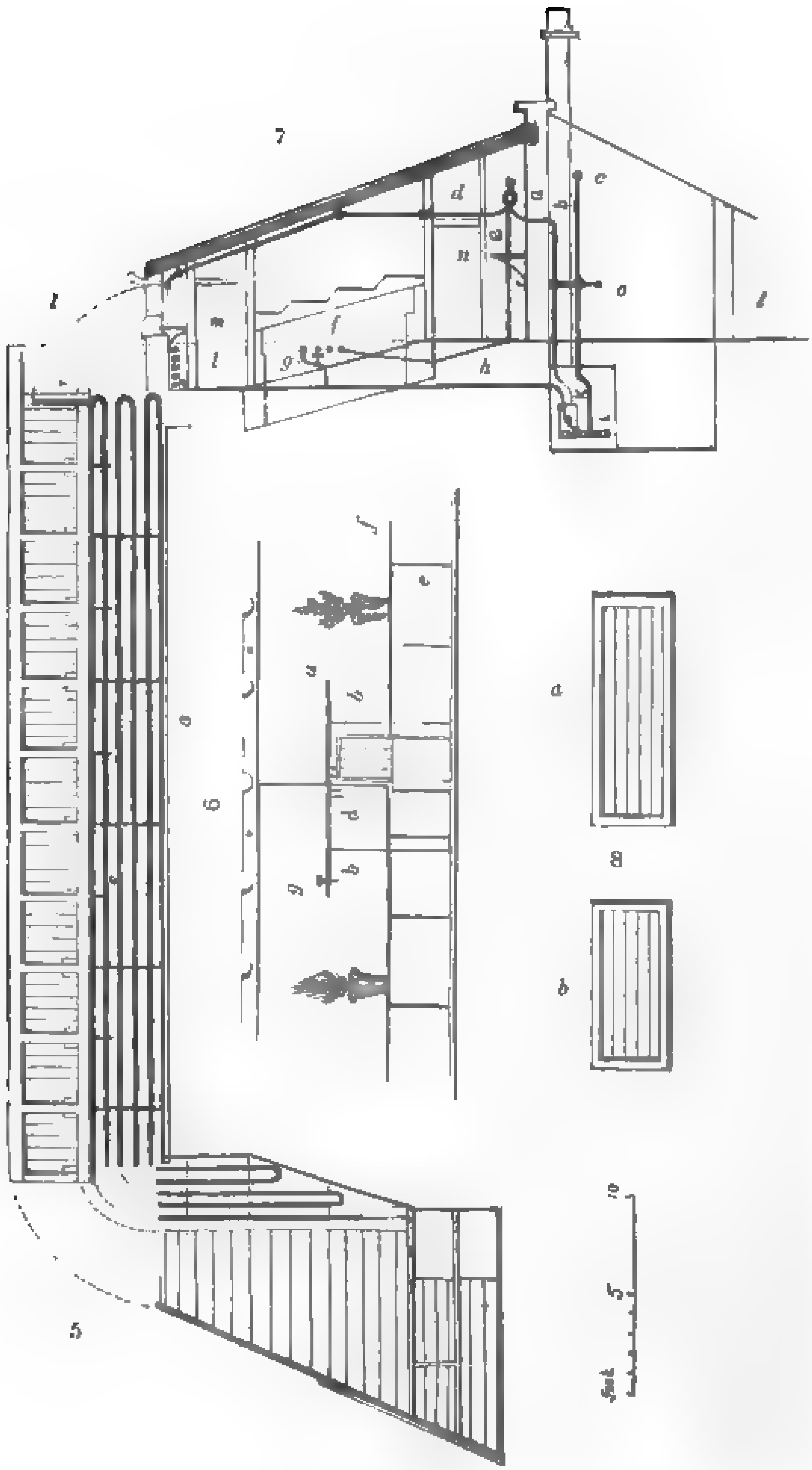
The annexed plans and description of a mode of heating by hot water, have been adopted at Wavertree, and, as far as we have gone, the system has realized every reasonable expectation, and affords a prospect of still greater advantages. I intend to send you next season, a particular account of the effect of this treatment upon pines, with such observations as a little more practice will enable me to make.

We aim at keeping the pits at 95 to 100 degrees, the houses at 70 to 75 degrees during the nights of summer, and 60 to 65 in winter. The pit pipes are kept constantly going, the house pipes at night, and when necessary turned off in the morning, but if the weather be very cold, they are also kept going constantly. The requisite degree of heat is easily obtained by regulating the damper and partly turning the cocks.

In consequence of the grate becoming choked with scoria it sometimes happens that open dampers and full circulation will not effect the desired heat; in that case tilt the door on the top of the furnace with an iron wedge, about two inches high, this will soon raise the heat to the degree required; in fact, where it is absolutely necessary to use coals, I would always have this door left a little open, as the hydrogen collecting at the top of the furnace, may explode, and rift the brickwork. Where coke is used, (which I would always recommend both for economy and cleanliness,) this can never happen, that principle being in a great measure extracted.

The value of the fuel used by us, when the pipes are all at work, is five shillings worth of coke in 21 days. The houses are 80 feet by 17 feet, and the height at back 10 feet 6 inches and in the front 6 feet 6 inches.





In the ground plan No. 1 (Fig. 33.) *(a)* is intended to shew two pipes upon the front walk. *(b)* Brackets supporting the front pipes, and iron trellising, round the house. *(c)* Cocks to turn the front pipes off. *(d)* Pipes for heating the Pine pits. *(e)* Cocks to turn the pit pipes off. (*f*) Iron trellising for flower pots. *(g)* Return pipes for each house, coned into the connecting pipe. (*h*) Connecting pipe. (*i*) Return pipe to the coil. (*k*) Flow pipe from the coil. (*l*) A portion of the pit, covered in with boards. (*m*) Holes cut in the boards, for the pine pots to rest on their rims. (*n*) Bearers to support the boarding and pots. (*o*) Sliding doors.

No. 2 is a section across the furnace. (*a*) is a coil or boiler consisting of fifteen rounds of inch piping set in a descending furnace: (*b*) Iron door and casing upon the top of the furnace, for putting down the fuel. (*c*) Double door for lighting the fire and drawing out the scoria. (*d*) Ash-pit door. (*e*) Grate bars. (*f*) Iron bridge supporting the wall which separates the fire from the coil.

No. 3 is a representation of the front of the furnace. (*a*) is the Ashpit door, (*b*) the fire door, (*c*) dust door, for cleansing the coil, (*d*) the same open, (*e*) the furnace top door.

No. 4 is a representation of the trellis, supported by the brackets (*b*) in the ground plan No. 1.

No. 5 is the elevation of the front (inside,) (*a*) is intended to represent six pipes against the front wall for heating the houses. (*b*) Openings in each alternate front light, with iron casing to admit the vines being taken in and out, by lifting up the light. (*c*) Short Brackets for trellising only.

No. 6 is the elevation of part of the back wall, (*a*) is the expansion pipe. (*b*) Flow pipes to pits. (*c*) Flow pipes to houses on each side of glass partition going over the doors to the front wall. (*d*) Flow pipe from the coil to the expansion pipe. (*e*) Brackets for supporting the back trellising. (*f*) Back trellising. (*g*) Air screw.

No. 7 is a section of the House and Shed. (*a*) Is the expansion pipe, (see (*a*) No. 6). *(b)* Flow pipe. *(c)* Filling pipe. (*d*) Flow pipes for each house. (*e*) Flow pipes for each pit. (*f*) Pit pipes. (*g*) Cock for pits: (*h*) Return pipes for pits and houses. [*i*] Connecting pipe. [*k*] Dust door for cleansing the back of the coil. [*l*] Six front pipes. (*m*) Brackets supporting front pipes and trellising. [*n*] Brackets supporting the back trellising. [*o*] Damper.

No. 8, shows the lights on the roof [*a*] is the bottom sheet and [*b*] the top sheet.

The small scale is for Nos. 1, 5, 6, 7, 8, and the large one for No. 2, 3, 4.

FLORICULTURE.

ARTICLE V.—NEW AND RARE PLANTS,

FIGURED IN THE PERIODICALS FOR OCTOBER.

CLASS I.—PLANTS HAVING TWO COTYLEDONES OR SEED-LEAVES.

LEGUMINOSÆ, the Pea Tribe.

LUPINUS NANUS, Dwarf Lupine.—The flowers of this beautiful Lupine are azure blue, purple, and white. Mr. David Douglas found the plant in California, and introduced it to the garden of the Horticultural Society, whence seeds have been distributed to various collections. It is a hardy annual, thriving in any light soil, and is found to produce seeds freely.—*Don. Brit. Fl. Gard.*

ACACIA BREVIPES, Short pedicelled Acacia.—This species has been cultivated at the Royal Gardens, at Kew, for upwards of twenty years. It is said to be a native of New South Wales. It is a hardy conservatory plant,—*Curt. Bot. Mag.*

ERICEÆ.

RHODODENDRON FERRUGINEUM *album*, White flowered rusty-leaved Rosebay.—A very dwarf shrub scarcely more than a foot high, with pure white flowers. It is very rare, and was probably originally obtained from the Pyrenees, when, according to the accurate Bauhin, this variety is frequently found.—*Don. Brit. Fl. Gard.*

AZALEA DANIELSIANA, Mr. Captain Daniel's Chinese Azalea.—This plant, like most of its congeners, thrives well in rough sandy peat earth, the pots being well drained, kept in a dry airy part of the greenhouse in winter, and then not over-watered. If placed in moist heat, previous to flowering, there is caused a more perfect bloom. It is probable that it may be propagated, like the other Chinese species, viz. by cuttings and layers. It is generally admitted, that the empire of China has furnished to Europe, more splendid flowering plants than any other portion of the globe; whether we view the various species collected in an indigenous state in that extensive empire, or the more generally cultivated and selected objects from the celebrated gardens of Fa-te, near Canton, where every plant worthy of cultivation is to be obtained. Captain Daniels, of the Honourable East India Company's Service, brought home several cases of rare plants, for Mr. Tate, of Sloane-Street, in 1830, among which were the *double red* and variegated Chinese Azaleas. The flowers of the A. Danielsiana are large, and of a bright scarlet colour. We have pleasure in stating, that from Tate's successful

management, if not now, he will soon be able to supply every botanical specimen of this new edition to our stock of Chinese ornamental shrubs, and which indeed no lover of fine plants should be without. —*Paxton's Magazine of Botany for July.*

PORTULACEÆ.

CALANDRINIA DISCOLOR, Two coloured leaved Calendrinia.—Among many other novel plants that adorned the Glasgow Botanic Garden, in 1824, these species of Calandrinia were not among the least beautiful. The C. grandiflora, C. speciosa, and the C: discolor. This last greatly resembles the C. grandiflora, in general appearance, the flowers are of the same kind of rose-colour, but are much larger than the C. grandiflora. They all succeed well, treated as greenhouse plants, or better still if planted during the summer months in the open border, where both the flowers and foliage attain a larger size, and a brighter hue.—*Bot. Mag.*

CACTEÆ.

ECHINOCACTUS EYRIESII, Sweet-Scented Spring Cactus.—This species was presented to the Horticultural Society, some years since, by Sir John Lubbock, who had procured it from Mexico, where the genus seems to exist in great numbers. It flowers at various seasons, and now and then forms an offset. Independently of the large size of the flowers, which rival in dimensions those of the Cereus tribe of *Cacti*, it is remarkable for the rich delicious odour they exhale at night, at which time its glorious blossoms expand. When young, they resemble long sooty-grey horns, covered over with a thick shaggy hairiness, and would never be suspected to conceal a form of the utmost beauty, or a clear and delicate complexion. When the hour of perfection has arrived, and the coarse veil of hair begins to be withdrawn, by the expansion of the unfolding petals, one is amazed at the unexpected loveliness which stands revealed in the form of this vegetable star, whose rays are of the softest white, while the disk is of a rich yellow, formed by the stigma, and the clustering anthers.—*Bot. Reg.*

EPIPHYLLUM SPLENDIDUM, Splendid Epiphyllum.—This very splendid species is a native of Mexico, from whence it has been lately introduced. It certainly, without exception, far surpasses, in size and splendour of the flower, any species or variety at present known. Neither the *speciosissima* nor the *grandiflora* will bear any comparison with it for size. It is, however, entirely destitute of that beautiful purple tint so characteristic of the flowers of the C. speciosissimus, and has something of an orange tint.—*Paxton's Mag. of Botany, for April.*

POLEMONIACEÆ.

Leptosiphon androsaceus, Androsace-like Leptosiphon.—This is a bushy annual, growing to the height of eight or ten inches. The flowers are collected into terminal heads, and vary in colour from white to pale blue and pink. The multitude of these flowers gives the plant a very gay appearance, and as it is perfectly hardy, and promises to seed well, there is no doubt but that in a short time it will be found an important addition to our flower-beds. Though perfectly hardy, it cannot bear our summer heats, and only flourishes in the spring, or more particularly in the autumn, when the sun has lost his power, and the nights are cool with heavy dews. It should therefore either be sown in the autumn so as to flower early, or in June, in order that it may be ready for blossoming in September. Any kind of soil seems to suit it, but it is not improbable that a shaded American border may be the best. It is a native of California, whence it was sent by Mr. Douglas.—*Bot. Reg.*

HYDROPHYLLEÆ:

Nemophila insignis, Shewy Nemophila.—The Nemophilas are all difficult plants to preserve in gardens. This elegant species is a low procumbent hardy annual, requiring a rich soil, not damp, and a situation fully exposed to the sun; it must be protected carefully from wet, when forming its seeds, or they will not ripen.—*Bot. Reg.*

ARTICLE VI.

HISTORY AND CULTURE OF THE CHINESE CHRYSANTHEMUM.

Linnæus, in 1753, first published this plant as a species, with two of its varieties, under the name of *Chrysanthemum Indicum*, in his first edition of the "Species Plantarum;" the same plant, under the name of *Matricaria*, having been given by Kœmpfer, in 1712, in his account of the plants of Japan, where it is cultivated by the natives in their gardens; and he describes eight double varieties of the genus, of various colours. It is also mentioned by Breynius, Plukenet, Rhæde, and Petiver. Thunberg mentions in his *Flora Japonica*, published in 1784, that it grows spontaneously near Nagasaki and other places in Japan; and Loureiro, in his *Flora of Cochin-China*, mentions it as one of the plants of that country. Rumphius, in his very elaborate work on the "Plants of Amboyna," published in 1750, is more particular in his information respecting this plant than any preceeding author. The Chinese, by whom it is held in high estimation, pay much attention to its culture: they keep it in

pots and jars, placing it before the windows of their apartments, and decorate their tables with it at their entertainments; on which occasions he that produces the largest flower is considered as conferring the greatest honour on his guests.

The varieties of this plant were introduced to Britain from France in 1790, having been brought from China to Marseilles in 1789 Before 1808, eight new varieties were introduced from China by Sir Abraham Hume and Mr. Evans. Between the years 1816 and 1823 seventeen new varieties were added to the list; and from subsequent importations, and variations from culture there are now more than fifty varieties in cultivation*.

The mode of culture is simple and easy, and may be explained in the following rules:—

1. The soil most suitable for their growth is a light, rich, turfy loam, mixed with good rotten dung, sand, and leaf mould, in the proportions, of one barrowful of the former to one-fourth of a barrowful of each of the latter.

2. *Propagation*. This is performed many ways, but there are four or five principal means, namely, by cuttings, suckers, division of the roots, layers, and occasionally, though but seldom, by seeds.

3. *Cuttings*. Take off the cuttings in April, this is preferable to planting them in the autumn, which is often practised. They should be taken from the upper part of the shoot, and from four to six inches long, according to the sort and strength of the shoots. Cut them off just below a joint, and trim of the leaves from that part which it is intended to insert in the soil.

4. When the cuttings are prepared, plant them in sixty-sized pots, in a soil made somewhat lighter than the one mentioned above, by the addition of a little more sand and leaf mould.

5. When potted, place them in a frame, and shut them close down with the lights, giving no air until they have begun to grow; also, whilst in this situation, they must be kept damp, and shaded from the violence of the sun by a mat. If it be not convenient to occupy a frame with them, they will grow very well, although not so rapidly, if placed in a somewhat shady situation out of doors, particularly if the pots be plunged in the ground.

6. In May, those placed in frames, and in June, those placed out of doors, will require their leading shoots stopping, in order to induce them to form handsome heads.

* This history is taken from a paper read in June, 1828, before the Vale of Evesham Horticultural Society, by the president, E. Rudge, Esq. and noticed some time since in the Gardeners' Magazine.

7. About the middle of June they will require shifting into a size larger pots, and the soil will now need to be made a little stronger than the last potting, by adding a little more loam. They must now be placed where they will have the benefit of the sun; and be well watered over head two or three times in a week, if the weather be dry. A south-east or south-west aspect we think preferable to one due south.

8. In August, again shift them into pots from six inches to one foot wide inside measure, and the same depth, being governed by the size of the plant and habit of the variety intended to be potted. In these pots they will flower, therefore the soil mentioned, Rule 1, must now be used, and the plants well watered, to settle the soil about them.

9. Never, in potting, pare the roots off with a knife: this is destructive to most plants. If the roots have become matted, loosen them a little with the hand. Also give to each pot a good drainage; for although when they are in full vigour they require a deal of water, yet they always suffer injury if the water be stagnant.

10. *Suckers* are taken from the old plants in April; these may be either planted three in a pot, four inches in diameter, or one in each sixty-sized pot. When potted they may be treated precisely as recommended for cuttings, shifting as often as they require it, until they are finally placed in the flowering pots.

11. *Division* of the roots is generally performed in February or the beginning of March. It consists in nothing more than, with a sharp knife or other instrument, dividing each root into as many parts as it will separate, allowing each part two or three shoots. These may be either planted in pots, or beds, or warm flower borders, where they may either remain to flower, or be removed, at the option of the cultivator.

12. *Layering* is performed about the beginning of July; merely peg the shoots at the third or fourth joint from the top into pots of soil; and, if watered when they require it, they will be all well rooted in three weeks or a month. When separated from the parent plants, place them in a shady situation, repot them when necessary, and treat them in the same way as cuttings.

If it is convenient to plant either the cuttings, suckers, divided roots, or layers, in pots; they will do very well if planted in a bed made of light soil for the purpose.

It is always advisable, where handsome plants are an object, to allow them to stand at a sufficient distance from each other, when growing, as not to injure each others' figure.

When it is desirable to have very large flowers, their size may be

increased by thinning out the small buds soon after they appear.

13. *Watering.* They require at all times a good supply of water and during summer they are greatly benefitted by being regularly watered twice a week at least, over the leaves. In August begin to water the pots with soap-suds, mixed with manure water, about once or twice a week, and continue it until they come into flower, which will be in November.

14. When they have done flowering, set them in a situation where they will not be injured by frost, and occasional watering will be all the care they will require, until the season again commences for propagation. It sometimes happens, when the buds of plants in pots are all formed, and promise to flower finely, that shortly after the time of removing them into the house for flowering, the greater part die off without expanding. This we judge is occasioned, in a general way, by the roots being allowed to grow through the bottom of the pots into the soil on which they stood; and on being taken from that situation, the fibrous roots are broken, and the consequence is, a more sudden check to the plant than it was able to bear; the effects of which may be readily discovered by the flagging of the leaves, and the buds changing colour. This may be prevented by timely moving the pots, and properly shifting into larger pots, at the time required.

The sorts in cultivation are as follows:—

1. Changeable white.
2. Purple.
3. Quilled white.
4. Superb white.
5. Tasseled white.
6. Quilled yellow.
7. Sulphur yellow.
8. Golden yellow.
9. Large lilac.
10. Rose or pink.
11. Buff or Orange.
12. Spanish brown.
13. Quilled flame yellow.
14. Quilled pink.
15. Early crimson.
16. Large quilled orange.
17. Expanded light purple.
18. Quilled light purple.
19. Curled lilac.
20. Suberb clustered yellow.
21. Semidouble quilled pink.
22. Semidouble quilled white.
23. Semidouble quilled orange.
24. Late pale purple.
25. Quilled salmon colour.
26. Small yellow.
27. Paper white.
28. Late pink.
29. Early blush.
30. Park's small yellow.
31. Blush ranunculus-flowered.
32. Tasseled yellow.
33. Changeable pale buff.
34. Curled blush.
35. Tasseled lilac.
36. Two coloured red.
37. Pale buff.
38. Windsor small yellow.
39. Clustered pink.
40. Semidouble quilled pale orange.
41. Starry purple.
42. Golden lotus flowered.
43. Brown purple.
44. Two coloured incurved.
45. Late quilled yellow.
46. Yellow Waratah.
47. Double Indian yellow.
48. Double Indian white.
49. Pale buff or orange.
50. Expanded salmon coloured.
51. Pale flamed yellow.
52. Old quilled pink.
53. Pale variety of pale buff.

These numerous varieties, when published in the Horticultural Transactions, being without arrangement, the late A. H. Haworth, Esq., very ingeniously formed a kind of natural arrangement of them, and published it in the Gardener's Magazine, Vol. ix. p. 218, which we here extract in his own words.

RANUNCULUS-FLOWERED.

1. *Yellow Indian,* Hort. Trans. vol. iv. p. 330. tab. 12. and vol. vi. p. 346. Of short stature (in its group), with very late and double, but small flowers, and forms, with the next, a distinct species.

2. *White Indian,* Hort. Trans. vol. vi. p. 347. Shorter than the preceding, with very late and similar, but white, flowers.

3. *Waratah Yellow,* Hort. Trans. vol. vi. p. 344. Flowers very late, with the preceding, and of similar size, but has much more entire leaves and larger flowers, which make it a distinct species.

4. *Spanish Brown,* Hort. Trans. vol. iv. p. 486. and vol. v. p. 420. Of short firm stature, and rather early and beautiful flowers, the size of the preceding, and with smallish leaves, a little more pinnatifid, and probably a distinct species.

5. *Blush Ranunculus-flowered,* Hort. Trans. vol. vi. p. 328. Of short firm stature, and fine-formed early flower, of a blush colour, and peculiar neatness of form. I think I have two variations of it.

6. *Small Deep Yellow,* Parks's Small Yellow, Hort. Trans. vol. vi. p. 327. Taller and weaker than the last, early and small-flowered, with small and blunt pinnatedly-lobate leaves. Perhaps it may be a distinct species, from its small leaves and flowers.

7. *Small Pale Yellow,* Small Windsor Yellow, Hort. Trans. vol. v. p. 415. and vol. vi. p. 335. Also called Aiton's Yellow. Of short stiff growth, and early flowering, and but little merit.

8. *Small Flat Yellow,* Small Yellow, Hort. Trans. vol. v. tab. 17. and vol. v. p. 422. Of shortish growth, and with pure yellow and expanded early flowers, the shape and size of the three subsequent varieties, of which it is presumed to be the origin, as yellow is the most predominant colour in these plants. Their forms are very neat and regular.

9. *The Buff, or Copper,* Hort. Trans. vol. v. p. 420. Also called the Orange, or Buff. Resembles the preceding in every thing but colour.

10. *The Rose, or Pink,* Hort. Trans. vol. iv. p. 344. Also called the Lilac. Résembles the last in all things but colour, and is now the most common kind in cultivation, although introduced after the old purple, hereunder enumerated.

11. *The Pale Pink,* Hort. Trans. vol. vi. p. 335, raised in Mr. Colville's nursery, being a sportive branch from the last, and differing in nothing but colour. This and the three preceding doubtless sport mutually into each other, and are perpetuated by cuttings of their respective sports in the first instance, and offsets as well as cuttings afterwards; but all are liable to sport again, from pale pink through deeper pink, and copper or light orange to bright yellow; but their shoots and leaves are immutable.

12. *Expanded Light Purple,* Hort. Trans. vol. v. p. 153, and vol. v. p. 421; and Bot. Mag. tab. 2256. Of middling size, and with flowers in the middle season (of its group), but nearly twice as large as the last, though resembling it in form, and far more handsome.

13. *Quilled Light Purple,* Hort. Trans. vol. v. p. 155; and vol. v. p. 421. A sport only from the last, but now made permanent.

INCURVING RANUNCULUS-FLOWERED.

14. *Incurving Lilac,* Sweet, Brit. H. Gard. tab. 7; Curled Lilac, Hort. Trans. vol. v. p. 155, and p. 421. Also called the Quilled Lilac: Grows tall and flowers early, and is an elegant plant, allied to the preceding, and has produced the following one from a sportive branch.

15. *Curled Blush,* Hort. Trans. vol. vi. p. 326. Has been called the Double Blush, and Double White, the flowers, which are rather early, large, and showy, dying off nearly of that colour. It is of middling stature in its group, and, although a sport only of the preceding, is now an established and more beautiful variety than it.

16. *The Quilled Pink,* Hort. Trans. vol. iv. p. 350, and vol. v. p. 351, 420, 421, and Bot. Reg. vol. viii. tab. 616. A tall stature, and one of the very latest in blooming, but very handsome, and repaying by its beauty every care bestowed upon it by the gardener. It has been called the most beautiful of all, but with me it yields to the gold-bordered red.

17. *Large Quilled Orange,* Hort. Trans. vol. v. p. 152, tab. 3. (upper figure), and vol. v. p. 421. A tall and large latish-flowering variety, of considerable beauty, and at present uncommon.

18. *Gold-bordered Red,* the Two-coloured Incurved of Hort. Trans. vol. vi. p. 332, 333. Of tall stature, very late, with the most perfect and beautiful flower of all its genus, although only of the middle size. The red petals are striped with gold beneath, and golden-tipped there, which tips, incurving strongly and gracefully, show the gold in a front view of the flower, which is golden likewise at its base within. I consider it the most complete of all.

19. *The Superb White,* Hort. Trans. vol. iv. p. 338, and vol. v. p. 420. A late, very tall, and splendid plant, with large incurving, very double, pure white flowers.

CHINA-ASTERED-FLOWERED OFTEN SHOWING A DISK, AND THEN MUCH RESEMBLING CHINA-ASTERS.

20. *The Sulphur Yellow,* Hort. Trans. vol. iv. p. 341, and vol. v. p. 420. A beautiful variety, of tall stature, and free and early blooming, with middle-sized aster-like flowers.

21. *The Two-coloured Red,* Hort. Trans. vol. vi. tab. iv. and vol. vi. p. 342, 343. A very fine and showy variety, of the middle-size in stem and flowers, but rather late, which sometimes shows a disk, and is very aster-like. The bipinnatifid flowers are far more laciniated than any other kind, and I think they constitute distinct species.

22. *The Early Crimson,* Hort. Trans. vol. v. tab. 3. (inferior figure), p. 151, and p. 421. Of light small stature, delicate, and apt to lose its leaves before its bloom is finished. The flowers are middle-sized, early, and very beautiful; they show a disk, and, when well managed, have ripened perfect seeds in England.

23. *The Clustered Pink,* Hort. Trans. vol. vi. p. 336. Also known by the name of the changeable Blush. One of the tallest of its tribe; flowers in the middle season very abundantly; and although the flowers are but middle-sized, and little better than half-double, showing a considerable disk, and greatly resemble China-asters, they make a very fine and durable appearance, standing the weather well, and becoming much darker by age, though less delicate. This is a very likely variety to produce seed in this country.

24. *The Early Blush,* Hort. Trans. vol. vi. p. 326. This tall and almost unequalled variety is also called the Double Blush, and Double White. It flowers very early, beautifully, and freely, and its flowers are large, and scarcely show any disk, and their colour without is light blush, but within they are exactly of that peculiar tint well known by the name of French White, and, like many other varieties, they are very durable. They have ripened seeds in England.

25. *The Paper White,* Hort. Trans. vol. v. p. 417, 422. This exquisitely white-flowering and noble variety is of all stature, and early blooming, and makes a splendid appearance in a general collection. Its flowers are of the middle size.

MARIGOLD-FLOWERED, WITH WELL-FORMED DOUBLE FLOWERS, RESEMBLING DOUBLE CAPE MARIGOLDS IN SHAPE AND SIZE.

26. *Golden Bronze-back,* Golden Yellow, Hort. Trans. vol. vi. p. 342, and Bot. Rep. tab. 4. (superior figure). Also called the Large

Yellow and the King's Yellow. A very tall, handsome, and free-flowering variety. The flowers are early and of a high rich yellow colour, but bronzed or orange in the buds and on their outsides. This is one of the best to grow as a standard, and if parted at the root, and annually transplanted, succeeds very well as a herbaceous plant, especially if in a warm or sheltered situation, duly supported by a stick.

27. *The Superb Clustered Yellow,* Hort. Trans. vol. v. p. 156, and vol. v. p. 421, and Sweet's Brit. Fl. Gard. tab. 14. One of the finest and tallest of the group, being higher than the preceding, and with more clustered and more neatly formed pure yellow flowers, but they are later in opening.

28. *The Golden Lotus-flowered,* Hort. Trans. vol. vi. p. 340. A very splendid and large long-leaved variety, and nearly or quite the tallest of this genus of plants, having late, pure, and deep yellow flowers, above the middle size, and larger than those of any other yellow kind of the marigold form, and which partially endure until the heavier frosts of winter destroy them.

29. *The Changeable Pale Buff,* Hort. Trans. vol. vi. p. 380, and tab. 3; also called the Pale Cluster. This plant, when flowering as perfectly as it is represented on the above cited table, is one of the most showy and splendid of the group; but this has not been the case during the autumn of 1832; and all the flowers, and in various gardens, which met the writer's eye, being as it were degenerated into almost buff-coloured and spuriously quilled flowers, of more upright appearance than the large, expanded, flat-petaled, and variegated purple-whitish and yellow-buffy ones, so charmingly depicted in the figure cited. They are of the middle season.

30. *Starry Changeable Purple,* the Starry Purple, Hort. Trans. vol. vi. p. 339. This beautiful plant is one of the most variable-flowered in the genus; its very late flowers first opening of a purple colour, with the exterior petals at first few in number, starry, and paler, especially at their spoon-shaped tips; soon, however, becoming still more pale, until the whole well-expanded and very double blossom becomes regularly more blush-coloured and white than purple, and is a very fine, well-formed, variegated flower. The stature of the plant is of a middle size, but its remarkable leaves are much more lacinated than usual, and often broader in their outline than long, which is not the case with any other in the group, and of very considerable size: wherefore I conceive it may be a distinct species from all the others.

31. *The Late Purple,* the Late Pale Purple, Hort. Trans. vol. v. p.

431, and vol. v. p. 422, and vol. vi. p. 353. Also called Large Pale Purple. This is a very late flowering, and rather tall variety, whose middling-sized and well-expanded blossoms are very neat, and resemble in shape those of the preceding, but are much smaller.

32. *The Brown Purple,* Hort. Trans. vol. vi. p. 341, 342. A tall and slender twigged very late-flowering variety, whose middle-sized flowers resemble the last in shape, but are not quite so flat and neat in expansion, and their colour in the group is very remarkable, being of a very dull brownish or reddish purple. The leaves are so small, and so bluntly lobed, and on such slender shoots, terminating in such long and graceful peduncles, that the plant is probably a distinct species from Chrysanthemum sinense, and differs not so much in leaf as in flower from our No. 6, the Small deep Yellow, above.

TASSEL-FLOWERED, BEING TALL OR VERY TALL PLANTS IN THEIR GENUS, WITH VERY LARGE DOUBLE, AND MORE OR LESS CONSPICUOUSLY DROOPING FLOWERS, WHOSE PETALS ARE USUALLY ELONGATED AND QUILLED, AND OFTEN GREATLY RESEMBLE THE FORM OF A TASSEL.

33. *Tasseled Flame Yellow,* the Quilled Flame Yellow, Hort. Trans. vol. iv. tab. 14, p. 349, and vol. v. p. 421. The magnificent flowers of this tall plant appear rather late, and often measure above five inches in expansion; and make, perhaps, if not a more neat, at least a more showy appearance than any other of the group, being double, and composed of innumerable chiefly quilled incurving petals, hanging more or less downwards, and when at their best resembling a flame-coloured tassel.

34. *The Tasseled Salmon,* the Quilled Salmon, Hort. Trans. vol. v. tab. 17*. (inferior figure), p. 414, and 422. This is a late-flowering slender and graceful plant, with large tassel-like and half-expanded, drooping, quilled, salmon-coloured flowers, and is very common.

35. *The Tasseled Yellow,* Hort. Trans. vol. vi. p. 329. A very tall and strong-growing large-leaved variety, with numerous tassel-formed flowers of the largest and most showy kind, often measuring more than five inches over, and appearing rather early. It is one of the most desirable and free-growing of the whole collection.

36. *The Quilled Yellow,* Hort. Trans. vol. iv. p. 341, and vol. v. p. 420. This is a tall variety, with rather large flowers, of the middle season, or later, producing its blossoms in clusters at the top of the strong upright shoots. It is also known by the name of the Quilled Straw.

37. *The Late Quilled Yellow,* Hort. Trans. vol. vi. p. 343. This has been called a very late and not very desirable variety in collections. It appears to me to be of the middle size, but it has not yet opened its blossom buds with me, not having long possessed it.

38. *The Large Lilac,* Hort. Trans. vol. iv. p. 343, and vol. v. p. 420. Also called the Late Lilac, the New Lilac, and the Semi-double Purple. A very tall upright plant, bearing but few double large and clustered flowers at the summits of the branches, and those so late in appearance, that in cold seasons they cannot expand well, and are consequently in but little repute. I have only seen one plant in blossom, and that in my own garden.

39. *The Tasseled Lilac,* Hort. Trans. vol. vi. p. 332. A middle-sized, or rather tall plant, of very great beauty, and one of the most desirable of the whole group, having very showy tassel-formed flowers, five inches or more in expanse, very numerous, early, and elegantly drooping from their weight, but they often show a disk. It is a likely variety to produce seeds of the most promising kind, but I have not hitherto heard of its ripening any in England.

40. *The Tasseled Purple,* the Purple, Hort. Trans. vol. iv. p. 334. Has also been called the Old Purple, the Old Red, and the Quilled Purple, and is figured in the Bot. Mag. tab. 327. This is a very beautiful and rather early-flowering plant, of almost the middle size. The flowers are very numerous, gracefully drooping, and of middling size, and are at first of a reddish purple colour, but become paler by age, and in mild seasons will continue in succession from the end of October to the second week in January. It acquires the name of old, from being the first China-chrysanthemum that came to England in modern times, and bloomed at Mr. Colvill's nursery, in Nov. 1795, but was said to be at Kew in 1790. The great horticulturist Miller certainly had one, or more likely two, of these Chinese or Indian chrysanthemums in cultivation at Chelsea long before; but it is not yet quite satisfactorily explained what sorts they were. See Hort. Trans. vol. iv. tab. 12, p. 326, and following.

41. *The Changeable Tasseled White,* the Changeable White, Hort. Trans. vol. iv. p. 336, and vol. v. p. 419, and Bot. Mag. tab. 2042. It has also been called the Old White, being the first white-flowered variety known in our gardens. It is recorded in the Hort. Trans. to have been raised from a sporting branch of the preceding, and, indeed, resembles it in every thing but colour. It is a very graceful and elegant plant, and in warm situations its flowers are often more or less tinged or dotted with purple or blush colour.

42. *The Narrow Quilled White,* the Quilled White, Hort. Trans.

vol. iv. p. 337, and vol. v. p. 419. This rather slender variety is almost of the middle size, and has the slenderest and most completely quilled florets, and the earliest flowers, of the whole group, which hang in gracefully drooping tassels, and form a strong contrast to the next in almost every respect.

43. *The Great Tasseled White,* the Tasseled White, Hort. Trans. vol. iv. p. 339, and vol. v. p. 420. Has also been called the Expanded White. This large, strong and broad, deep-green, shining-leaved variety, is one of the latest of all in blooming; but its lovely flowers are larger and more showy than those of any white-flowered variety, and endured to the end of January, 1833, the date of the present paper. No flower in this chilly climate stands the cold so well, or so long continues to beguile the fancy of a florist by its protracted opening, by its hardihood in expansion, and by the soft hue of its snowy blossoms, carrying on, as it were, the flowery beauty of lingering autumn into the very bosom of winter, whose ice at length closes the temple of Flora for a time, until the herald flowers of spring appear amidst the melting snow, as if impatient of delay.

Half-double tassel-bowered, with only half-double flowers, and narrow elongated quilled petals, often drooping, and somewhat resembling a tassel.

44. *Half-double Quilled White,* Semi-double Quilled White, Hort. Trans. vol. v. p. 158. A very tall, robust variety. The flowers are among the latest varieties, and more inclining to be single than usual, yet of too late occurrence to ripen seed with us. They are very large, and the narrow-quilled petals are very singularly waved, as if pursuing each other from right to left, making a pleasing and almost animated appearance.

45. *Half-double quilled Pink,* Semi-double Quilled Pink, Hort. Trans. vol. v. tab. 17* (inferior figure), p. 157, andvol. v. p. 422, and vol. vi. p. 351. This variety grows rather tall and flowers latish, but its flowers, although but half double, and only of the middle size, possess a degree of graceful elegance and lovely hues peculiarly their own. It is at present a rare variety.

46. *Half-double Bronze Buff,* Pale Buff, Hort. Trans. vol. vi. p. 334. Also called the Semi-double Pale Buff, and Reeve's Pale Buff, and Quilled Buff, and the Buff. It is a very tall and free-growing variety, and its half-double buff large flowers, which in their early stages are much bronzed, though of coarse hues, make a showy appearance, and stand the weather better than all others, opening rather early, and continuing late, until all the bronze is gone, having faded to a dull buff.

47. *Half-double Quilled Orange,* Semi-double Quilled Orange, Hort. Trans. vol. v. p. 412 and 422, and vol. v. tab. 17** (left-hand figure), and vol. vi. p. 352. A tallish plant, with but few large and almost single, and also some nearly half-double flowers, of good size, but making a poor show.

48. *Half-double Pale Quilled Orange,* Semi-double Quilled Pale Orange, Hort. Trans. vol. vi. p. 337. Also called Semi-double Deep Yellow. Of the middle stature, with few and late flowers, of good size, but comparatively poor appearance, on loosely drooping footstalks.

Obs. The author has rejected the hybrid word semi-double throughout the paper.

ARTICLE VII.

A POPULAR FALLACY RESPECTING THE SUNFLOWER.

BY VIOLA.

WHO has not heard that the sunflower keeps her face turned invariably towards the sun? From the peer to the peasant it is believed—science has vouched the fact—ignorance implicitly credits the assertion—poets gladly seize, and dilate upon so eloquent a theme; and we dote upon such elegant lines as the following:—

"The heart that has fondly lov'd never forgets,
But truly loves on to the close;
As the sunflower turns to her god when he sets,
The same look which she turn'd when he rose."—T. MOORE.

Thus are our senses taken captive, and we are led willing dupes in the track of those who chance to take the lead.

That able botanist, and amiable man, the late Sir James Edward Smith, has unaccountably fallen into the popular error of believing in the above-mentioned truly feminine and graceful quality of constancy, attributed to the sunflower. In his "Introduction to Botany," 2nd edition, p. 209, he says,

"Nor is this effect of light peculiar to leaves alone. Many flowers are equally sensible to it, especially the compound-radiated ones, as the daisy, sunflower, marigold, &c. In their forms, nature seems to have delighted to imitate the radiant luminary, to which they are apparently dedicated: and in the absence of whose beams, many of them do not expand their blossoms at all. The stately annual sunflower, *helianthus annuus,* displays this phenomenon more conspicuously, on account of its size, but many of the tribe have greater sen-

sibility to light. Its stem is compressed in some degree, to facilitate the movement of the flower, which, after following the sun all day, returns after sunset to the east, by its natural elasticity, to meet his beams in the morning.

"Doctor Hales thought the heat of the sun, by contracting the stem on one side, occasioned the flower to incline that way; but if so, it would scarcely return completely at night."

Voltaire's pleasant exemplification of superstition here presses itself forcibly on my recollection. A giant, seventy feet high, is reported to exist; the learned soon begin to discuss and dispute about the colour of his hair, the thickness of his thumb, &c. They exclaim, cabal, and even fight on the subject. A stranger modestly doubting whether the giant in dispute really exists, draws down the whole weight of wrath, of all the angry disputants, upon his devoted head; and, after having despatched the offender, they fall again to disputing and speculating upon the thickness of the giant's nails, and size of his little finger.

So, of our giant, let us be certain that it exists, before we go into disquisitions with Doctor Hales, respecting the "contraction of the stem, by the heat of the sun, to enable the flower to incline," &c.

Three years since we had saved an unusual quantity of the seed of this plant; and having heard, that by feeding poultry upon the ripe grains, the flavour of game would be imparted to their flesh: having, moreover, ample space to make the experiment, we sowed an immense number in different parts of the premises,—in shade, in sun, in beds, clumps, rows, and shrubberies: every variety of soil and situation, which we could command, was afforded it; and a glaring, tasteless, frightful display of disks, was the consequence.

The experiment however was serviceable, it enabled us to prove the inaccuracy of two popular assertions, that the flesh of poultry, fed on the seeds, acquires the flavour of game; and that it was the nature of the flower to turn towards the sun. We made it a particular point to watch the plants, in the then full expectation of proving the truth of the remark—not with a view to refute it: for as others are, we were—i. e. *firm believers in the existence of the giant*, or rather in the delicate susceptibility of the plant, to the influence of the sun. I remember, that a rigid, sullen, down-looking, broad, ugly, brown face, with a scanty, short, bristly-looking beard of dingy yellow, resolutely keeping its head bowed towards the earth, first made me sceptical on the subject of its poetical constancy: I raised, and propped its drooping ill-looking face, and hoped to find that the morrow's sun had cheered it. No—it loathed the bright luminary, and

lived and died without having caught a stray beam upon its face. This led us to investigate others. We looked at all hours, and found them ever the same: as the buds unclosed, so the flowers remained, looking to every point of the compass. The same disk that nodded to the north-pole star, where it opened, retained its unvarying position, apparently more attracted by its magnetic influence, than by the electrical light of the sun, that was travelling in the south. The same fierce face that would be glaring at me, and looking due east in the morning, still stared due east when I went to visit it in the afternoon, and again by the light of the moon at night.

So fair an opportunity of watching and remarking so great a number of plants, as we at that time possessed, is seldom afforded; and so well did we profit by our opportunity, that, without fear of contradiction, I repeat, that whoever will carefully examine the inclination of a number of sunflowers, will find that the heads do not vary from from the position in which they first appear—that that position indiscriminately points in every direction, and that the rigid unyielding fibrous stalks remain "*uncontracted* by the heat of the sun," and possess no elasticity whatever.

July 28th.

RURAL AFFAIRS.

ARTICLE VIII.—EXTRAORDINARY SUCCESS OF MR. NUTT'S MODE OF TREATING BEES.

COMMUNICATED BY MR. W. T. SMART,

Witham on the Hill, near Bourne, Lincolnshire.

Mr. Nutt's apiary, at Moulton Chapel, now affords a most interesting display of honey, which has been obtained from his hives this present season; it will remain about three weeks for exhibition there, before its removal to the exhibition of Arts and Manufactures in London; and it is probable that never before was so large a quantity concentrated in one spot, the produce of one Apiary. From ten hives, he has obtained no less than nine hundred pounds of honey; being an average of ninety pounds weight from each hive, the greater part of which was removed on Thursday the 21st inst. in the presence of Mr. Booth, lecturer on Chemistry, Benson Rathbone, Esq. of Beccles, Suffolk; the Rev. T. Llark, of Gedney-Hill, and several other Gentlemen, with scarcely the destruction of a single tree. The interest of the display is greatly heightened by a collection of honey from other Apiarians, practitioners of Mr. Nutt's System: and su-

perior as its objects are in point of value, as well as interest to many, over floral collections and exhibitions, it will no doubt excite great attention.

Assuming that the above quantity was attained by the bees in a circuit of three miles in diameter, what an immense addition to the revenue of the country might be gained, if an equal number of hives on these principles were established within every similar district in the kingdom.

The Apiary of the Rev. T. Llark, Vicarage-house, Gedney-Hill, one of the earliest as well as most successful of Mr. Nutt's Aparian pupils, has during this season excited much attention in the surrounding neighbourhood, on account of the superior value and the great quantity of the products, three hives having yielded no less than two hundred and forty pounds of the purest honey, whilst the extraordinary state of prosperity in which they remain is justly a subject of admiration with those inexperienced in the system.

The above I have copied from the Stamford Mercury, sincerely hoping that it will be the means of attracting the attention of all who have bees under their care, as from what has fallen under my personal observation, I am confident that a more humane, productive and interesting system does not exist in the present day. I have one set of boxes under my care, from which last season I took 64lbs. viz. One box of 42lbs., one glass of 12lbs. and one glass of 10lbs. In quality it was far superior to any I ever saw, as, in the whole taken, there was not a brood bee, or even a cell of bee bread, and as it was taken without fumigation, the flavour of the honey was not contaminated. Should further particulars be requested, I shall be happy to furnish them, as it is my wish to see every cottage supplied with so useful an appendage.

Witham on the Hill, Aug. 5th 1834.

ARTICLE IX.—ON FOREST-TREES, WITH REFERENCE TO THEIR PICTURESQUE BEAUTY.

Chiefly selected from "Gilpin's Forest Scenery."

BY VIOLA.

Trees, with reference to their *utility*, are so frequently the subjects of discussion, in periodical writings, that a few remarks on their *ornamental qualities*, may not be unacceptable—as a variety. They are objects of beauty and of interest and enjoyment to almost every person possessing a pure taste; yet although they are attainable by all who can call a rood of land their own,—the more beautiful speci-

mens, are only to be found (with rare exceptions,) in the parks of the wealthy, and in the few chase-like forests which still remain, of the numbers that flourished in the olden time. Various reasons operate against the existence of perfect specimens of trees in small estates, but the principal cause is, that our love of money exceeds our love of trees. Every inch of cultivatible earth is turned to the best account; —" trees injure our crops by their drip"—therefore we either grub them up; or lop and mutilate the branches of those lovely denizens of our fields, to obtain fuel for our fires; and "fine sticks of timber' to be sold to the highest bidder.

How frequently too is our bad taste, as well as love of gain, made conspicuous, in the manner of pruning a tree: limbs are amputated, with a barbarous indifference to the effect produced by *equal balancing;* —as a surgeon might take away antagonist muscles from the human frame, leaving "lob"-sided patients to halt through the world. Gilpin—the picturesque writer *par excellence,*—justly observes " a tree must be well balanced, to be beautiful, it may have form, and it may have lightness, and yet lose all its effect by wanting a proper poise.

The opening section of Gilpin's charming work—the "Forest scenery"—offers a fund of tasteful remark, and close observation; — he thus begins his book.

"It is no exaggerated praise to call a tree the *grandest* and most *beautiful,* of all the productions of the earth. In the former of these epithets, nothing contends with it; for we consider rocks and mountains as part of the earth itself. And though among inferior plants, shrubs and flowers, there is great beauty; yet when we consider that these minuter productions are chiefly beautiful as individuals; and are not adapted to form the arrangement of *composition in landscape;* nor to receive the effects of light and shade; they must give place in point of beauty,—of *picturesque beauty* at least, which we are here considering—to the form and foliage, and ramification of the tree. Thus the splendid tints of the insect, however beautiful, must yield to the elegance and proportion of animals, which range in a higher class.

With animal life, I should not set the tree in competition. The shape, the different colored fur, the varied and spirited altitudes, the character, and motion, which strike us in the animal creation, are certainly beyond still life, in its most pleasing appearance. I should only observe with regard to trees, that nature has been kinder to them in point of variety, than even to its living forms. Though every animal is distinguished from its fellow, by some little variation

of colour, character, or shape; yet in all the *larger parts,* in the body and limbs, the resemblance is generally exact. In trees it is just the reverse: the *smaller parts,* the spray, the leaves, the blossom, and the seed are the same in all trees of the same kind: while the larger parts are wholly different: you never see two oaks with an equal number of limbs, the same kind of head, and twisted in the same form: and it is from these larger parts, that the most beautiful varieties result. * * * *

Trees when young,—like striplings,—shoot into taper forms: there is a lightness, an airiness in them which is pleasing; but they do not spread and receive their just proportions, till they have attained their full growth. There is as much difference too in trees, (I mean in trees of the same kind) in point of beauty, as there is in human figures. The limbs of some are set on awkwardly; their trunks are disproportioned, and their whole form is unpleasing. The same rules which establish elegance in other objects, establish it in these. There must be the same harmony of parts; the same sweeping line; the same contrast; the same ease and freedom. A bough indeed may issue from its trunk at right angles, and yet elegantly, as it frequently does in the oak; but it must immediately form some contrasting sweep, or the junction will be awkward.

All forms that are *unnatural,* displease. A tree lopped into a May-pole, as you generally see in the hedgerows of Surrey and some other counties, is disgusting. Clipped yews, lime hedges, and pollards, for the same reason are disagreeable; and yet I have sometimes seen a pollard produce a good effect, when nature has been suffered for some years, to bring it again into form; but I never saw a good effect produced by a pollard, on which some single stem was left to grow into a tree. The stem is of a different growth; it is disproportioned; and always unites awkwardly with the trunk.

Not only all forms that are unnatural, displease; but even natural forms, when they bear a resemblance to art, unless indeed these forms are characteristic of the species; a cypress pleases in a conic form, but if we should see an oak, or an elm growing naturally in that, or any other constrained shape, we should take offence. In the cypress, nature adapts the spray and branches, to the form of the tree. In the oak and elm, the spray and branches produce naturally a different character.

Lightness also is a characteristic of beauty in a tree; for though there are beautiful trees of a heavy as well as of a light form; yet their extremities must in some parts be separated, and hang with a degree of looseness from the middle of the tree, or the whole will

only be a large bush. Such is the horse-chesnut, the form of which, is commonly unpleasing. From position indeed, and contrast,—heaviness, though in itself a deformity, may be of singular use in the composition both of natural and of artificial landscape.

A tree also must be *well balanced* to be beautiful. It may have form, and it may have lightness, and yet lose all its effect by wanting a proper poise. The bole must appear to support the branches. We do not wish to see it supporting its burden with the perpendicular firmness 'of a column. An easy sweep is always agreeable; but at the same time, it should not be such a sweep as discovers one side plainly overbalanced.

On bleak sea coasts, trees generally take an unbalanced form; and indeed in general some foreign canse must operate to occasion it; for nature working freely, is as much inclined to balance a tree upon its trunk, as an animal upon its legs.

And yet in some circumstances, I have seen beauty arise even from an unbalanced tree; but it must arise from some peculiar situation, which gives it a local propriety. A tree, for instance, hanging from a rock, though totally unpoised, may be beautiful; or it may have a good effect, when we see it bending over a road, because it corresponds with its peculiar situation. We do not in these cases, admire it as a tree, but as the adjunct of an effect; the beauty of which, does not give the eye leisure to attend to the deformity of the instrument, through which the effect is produced.

Without these requisites therefore, *form, lightness,* and a *proper balance,* no tree can have that *species of beauty,* which we call picturesque."

In this age of improvement, such writing and remarks as the foregoing cannot fail to have their due weight, and to be appreciated as they deserve: they form an admirable introduction to the characteristics of the different trees of England, whether native or naturalized.

June 15th, 1834.

ARTICLE X.—QUERIES AND ANSWERS.

HOW CAN I EXTERMINATE DAISIES FROM GRASS LAWNS? Could you inform me, if there is any method of exterminating Daisies from Grass Lawns;—they are a great annoyance to a friend of mine, who has a very pretty little Pleasure Ground. He says there were none three or four years since. H. P.

HOW SHALL I CULTIVATE THE OXALIS CRENATA? Be so good as let me know the culture of the Oxalis Crenatus. Having received

a small tuber, in February last, from a friend, I planted it whole in a pot, and put it into the vinery, until it had pushed, which it did slowly at 6 eyes. I then took it out of the pot, and cut it into 6 sets, planted them again in pots until May, when I planted them out on a vine border, where they soon began to grow vigorously, but through the course of the summer all the old plants have died, owing to the stem cankering by the surface of the ground. I have raised nearly 300 plants from the tuber which I received, by striking them by cuttings, which they do most readily, and are all in a thriving state at present, but I am afraid they will not produce any tubers, as the two old plants show no signs of forming any young tubers. Now is it the nature of the plant, to be long in forming its tubers? I have made several tarts of its branches, which are very tender, and resemble apples. G. E. J.

HOW SHALL I BUILD A PIT FOR FORCING ASPARAGUS? Being about to erect three pits for forcing Asparagus, and being rather at a loss to know upon what plan to proceed, I shall be much obliged to you for your advice, through the pages of your highly useful and instructive *Register*, and if possible give a plan. I have never had the charge of forcing Asparagus upon any other plan than dung beds, with old plants, which has been in use for many years, after once forced destroying the bed and throwing the plants away. Now I want to know how to force the plants so as not to have them to throw away, so as I can force them year after year successively. What puzzles me most is this, how am I to protect the bed after the grass is all cut (beginning to cut at Christmas) so as to keep the plants in a healthy state, until I can expose the whole bed to the open air, which will be about the middle of April or beginning of May,—for I think if exposed much earlier, the plants may receive a check from which they may not recover through the whole summer, and consequently they would be unfit for forcing the winter following. Your early answer to the above will oblige. G. E. I.

HOW SHALL I CULTIVATE GERANIUMS SUCCESSFULLY? Being an ardent admirer of flowers, but particularly Geraniums, when grown to perfection, and having tried in vain to succeed so well as I could wish, perhaps you will be kind enough to answer the following queries, in time for me to profit by them this season. I have tried the methods named in pages 102, and 517, Vol. 1, of your *Register*, but cannot make either answer. The plants grow very strong, and appear very healthy, but show little or no disposition to flower, and when they do, the bloom is very weakly. I keep them all winter in a brick pit, and as dry as I possibly can: What time then should

I strike the cuttings so as to blossom about April or May? Should they be put into large pots, as soon as they are well rooted, or allowed to remain in the small pots till spring. I have been advised to flower them in small pots, about three inches diameter, and the same depth, bnt have not tried it. Do you think it a good plan? Should the cuttings be the ends of shoots, or pieces of stalks cut three or four joints long? What is the best method of renovating old plants, so as to make them bloom well; should they be cut down, and when? Should the compost be a light rich one, or a strong one?

Early answers to these will greatly oblige your constant Subscriber. GERANIUM.

Worcester, April 20th, 1834.

P. S. There are now in this town at the florists, Geraniums not 6 inches high above the pots, with 5 or 6 more large bunches of blossoms. I am desirous to know how they manage them.

SAW-MILL at DUNKELD ENQUIRED AFTER?—Pray will you obtain from your intelligent Dublin correspondent, Mr. Murphy, the Agent to the Arboricultural and Horticultural Societies of Ireland, a full and detailed account? so that if I wished it, I could erect such another Saw-Mill, which he saw at work at the Duke of Athol's, at Dunkeld, and which he tells us in Vol. 1, page 504, of your *Register*, pleased him so much by its simplicity, and which he considered of so much importance to proprietors of wooded lands, that he erected a working model of it, together with some simple contrivances used in Switzerland for similar purposes. He is good enough to offer to show it to any person who will call on him, but how can a busy man go 300 miles to see it? If he would send a description of it either to you, or, if it does not suit your work, to the Mechanics' Magazine, he would confer a lasting benefit on practical agriculturists. I am persuaded, I shall live to see a circular-saw, of some construction or other, as much an appendage to a farm yard, as a chaff-cutter now is. The labour which a saw turned by a horse or donkey would save, is something enormous. THOS. DEE.

ARTICLE XI.—COLLECTIONS AND RECOLLECTIONS.

DISEASES OF MELONS, AND THEIR PREVENTION NOTICED.—Many gardeners experience much difficulty from the effects of Red Spider and Canker in Melons, the former being caused by keeping them too dry, and the latter arising from too much moisture. In order to avoid these evils, the following directions should be particularly attended to:—When the weather is hot, or there is a strong heat, it is necessary to be free in the application of water, especially round the sides of the boxes; for when the plants cover the bed, it will not be requisite to give any in the centre over the stems. When the plants cover the bed, always water without a rose, observing that it should invariably be done early in the morning, and when the weather is fine, so as to allow the vines to get dry before night, which would not be the case, if watered in the afternoon; and should the weather prove dull the next day or two or three days, they are sure to become cankered. The only mode of cure for the canker is to keep the plants dry, and give a good heat; being careful at the same time not to run into the other extreme, by assisting the generation of Red Spider. But if the plants are kept thin of Vine, and water be applied in the manner before directed, no fear need be entertained of either of the disorders. THOS. HALLUM.

DIAMONDS.—A striking proof of the extraordiary differences of appearances which the same body may assume, and also of the intrinsic worthlessness of some of those objects on which Society sets the highest value, occurs in the instance of charcoal: Every one knows the enormous price at which diamonds of good quality and size are estimated. The celebrated Regent diamond, which was set in the handle of the late emperor Napoleon's sword of state, is now valued at £260,000, although it weighs only about 1¼ ounce, and was originally purchased for £20,400, by Thomas Pitt, Grandfather to the great Earl of Chatham, while governor of Madras. Yet this precious ornament is neither more nor less than a piece of charcoal; and, surprising as it may appear to those hitherto unacquainted with the fact, it is well proved, by numerous experiments, that between the diamond and charcoal, there is almost no difference of composition: the diamond burns in oxygen with brilliant flame, and, like charcoal, forms carbonic acid: like charcoal, it forms steel by combination with iron: and the difference between the two bodies seems to be chiefly in their state of aggregation, the diamond being harder and crystallised. It is also a little purer in composition. The pure portion of charcoal is distinguished among chemists by the name of *Carbon.—Lard. Cat. Cyclop.—Chemistry.*

ARTIFICIAL DIAMONDS.—At a recent meeting of the Academie des Sciences, a letter was read from M. Gannel, stating the result of his inquiries into the action of phosphorus brought into contact with carburet of pure sulphur. Having occasion to prepare a large quantity of carburet of sulphur, M. Gannal conceived the idea of endeavouring to separate the sulphur of this product in order to procure a pure carbon. Phosphorus was the material he employed, and which by entering into combination with the sulphur, the carbon was set at liberty in the shape of small crystals, possessing all the properties of the diamond, especially that of scratching the hardest bodies.

NOVEL MODE OF PACKING GAME.—If it be not a departure from your plan, I think a vacant corner of your entertaining and instructive miscellany might be well occupied (in the absence of more important information) by the insertion of the following singular mode of sending a present of game to a landlord. A highly respectable young farmer in my neighbourhood, took a turnip from his field, and having scraped out the inside, enclosed in it a Hare, a Rabbit, a brace of Pheasants, and a brace of Partridges; these he covered in with the slice he cut off the top, and sent them to his landlord. Not a feather was plucked, and the novelty of the circumstance must have pleased the landlord, if it were only in proof of the skill and ingenuity of his tenant. G. S. SOMERSET.

Windsor, Oct. 6th, 1832.

FURTHER TESTIMONIALS ON THE UTILITY OF THE PATENT GAS-FURNACE OF MESSRS. CHANTER AND CO.—In the furnaces on this patent, three desirable objects are ensured. The perfect combustion of the fuel; the gradual regulation of the fire, by which a constant and uniform temperature is ensured; and the equable application and distribution of heat. How far it answers the end, the following testimonials will show.

Stratford-Green, 3 *Mo. 7th*, 1834.

J. CHANTER & CO.

Respected Friends,—I feel it to be due to you to acknowledge, that after three or four weeks' trial, I find your Patent Gas-Furnace fully to answer my expectations from it: we have ready command of all the heat we require for the Patent Stoves, and Conservatory, with considerably less fuel, and attention to the fire. The Boiler (Weeks's Patent) was inadequate to the work to be done with the common Furnace, and I think myself fortunate in having remedied the deficiency so easily by the addition of your Patent Gas-Furnace. Call on me with your account, and it shall be discharged forthwith.

I am, respectfully, Your Friend,

JOHN ALLCARD.

Stoke-Nervington, March 18th, 1834.

SIR,—Having only used the Apparatus invented by Mr. Witty for a few days since you put up the same, yet I cannot withhold my approval of it; as far as I can observe it quite deserves all the encomiums which has been bestowed on it, as the purpose to which we have applied it, viz. to heat a Steam-Boiler; the flue of which takes a horizontal direction of 150 feet to warm a pipe, which I consider has a deadening effect to the draft, after which it takes a perpendicular direction in a chimney. It appears to answer every purpose anticipated, we have as little smoke as it is possible to expect; the fire is more effective under the boiler, and it consumes less fuel. I intend, after a month's trial, to write to Mr. Chanter on the subject, when I may be better prepared to state facts: in the meantime, should you see him, you can explain to him that we are quite pleased with it so far. I write thus much to you, thinking, perhaps, both you and Mr. Chanter may naturally be auxious to know the result.

We remain, Sir,

Your Obedient Servants,

Mr. Walton. WM. ADAMSON & SON.

University Gardens, Nov. 28th, 1832.

SIR,—It is upwards of twelve months since the erection of our Gas-Furnace; and since that time, both Mr. Fairburn and myself are perfectly satisfied that it has all the advantages you had led us to expect. The fuel we burn is of the very worst description,—so bad that when a gentleman (the Rev. Mr. Baker) of Nuneham Courtney, who called to see our apparatus in operation a short time since, appeared to doubt the possibility of consuming such refuse, until he saw the carbonizing plate charged with it, which was producing a very high temperature in the hothouse. I am glad to hear you have fixed one to his hothouse, which I am sure will give great satisfaction, as it may be managed with half the trouble and half the consumption of coals. I think the most appropriate name for it would be "the Garden's Friend," as we are never required to attend the fire from seven or eight in the evening until the same hour the next morning. During the whole of last winter the fire was not out for weeks together. Mr. Fairburn wishes you to call at the Gardens, and take dimensions for applying one to each of our pine-pits and greenhouse.

I am, Sir, your very humble Servant,

THOMAS COLLEY,

Gardener to Mr. Fairburn.

Description of a Musical Dial Fountain.—I venture to send the following description, and annexed diagram, of what I designate a Musical Dial Fountain; if it be no acquisition, it certainly will add to the variety of this description of Garden Ornaments, and may be somewhat interesting to some of your numerous readers, who like myself, may be fond of a little amusement this way. Its principles may be readily understood. Fig. 35, *a*, *b*, is a

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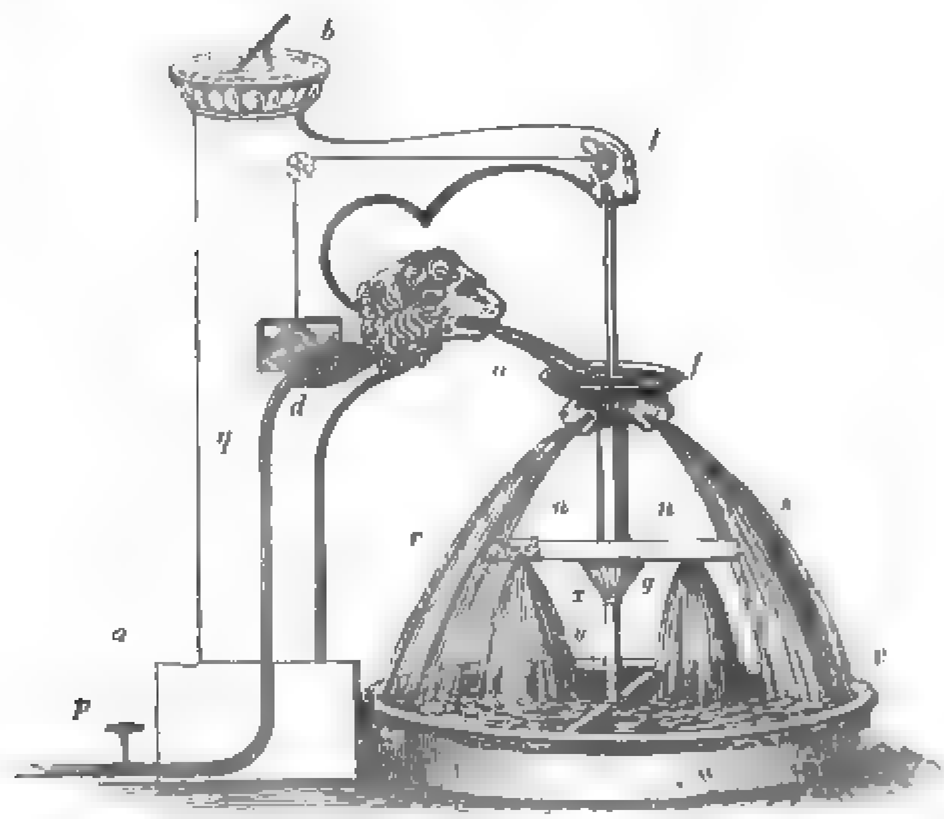

pedestal varied in form, as taste, or fancy may suggest, provided a sufficient cavity be left as at (*d*.) for the introduction of a small wire musical instrument, or box, with a horizontal dial at its summit as (*c*,) *p*, *q*, is the conducting pipe, which discharges water from the figure (*o*,) into the vessel (*f*) which is a tubular vessel on Dr. Barker's principle, at the bottom is attached the horizontal trunk (*r*, *s*,) near the ends of which, but on opposite sides thereof, must be made two holes (*n*) and (*n*) while the vessel is kept full of water, and continues to have free egress through the holes (*n*) and (*n*) the pressure is entirely removed from those points, and the pressure against the opposite side will turn round the figure or vessel (*f*, *g*,) and discharge the water into the bason (*v*) beneath it. The bottom part (*x*, *y*,) turns in a groove in the cross bar, or at the bottom of the fountain the top part turning a small cog wheel, within the extremity of the projecting plate (*l*) which communicates by wire or otherwise, with the instrument it has to play, which being fixed within, or near the

figure *(o)* makes it appear as though the sounds proceeded from the figure. The overplus water may be projected from as many fanciful figures as may be thought necessary, placed round about *(f)* altogether forming an unusual and very pretty effect. A. Godwin.

Collycroft, April 4th, 1832.

Curious Epitaph.—Well knowing that a little variety will prove interesting to your numerous readers, and beneficial to you, I venture to scribble something that you may either reject or adopt, as you think proper. Deuteros.

EPITAPH ON A GARDENER.

Beneath the adjoining Yew,
Resolving into its original clay,
Lie the remains
of
CHRISTOPHER SAGE,
Late of this Parish,
GARDENER.

Few men had more business on earth, and fewer still
Choose better ground for action.
He was so perfect a master of his Thyme, and had
Such a controul over the Mint,
That it need but be mentioned,
What with raising his Celery, and fingering the Penny-
Royal, the season was considered very improlific, that did
Not produce a Plumb.
To shew his consequence in life
Though moving in so humble a sphere,
It is no less strange than true that he met with more
Boughs than a Prime-Minister;
Could boast of Laurels equal to all the Princes of
Europe;
And possessed at one time a greater number of Beds
Than were found in any Palace, ancient or modern.
Notwithstanding he always exhibited a strong propensity
For Raking (which most men have occasion to Rue),
And was suspected to have increased the Families of the
Lilies, the Roses, and the Stocks.
He made it more of business than pleasure,
Turning a number of Slips to his own advantage;
For his Wife had been often heard to declare, that she
Had so neat Heart's Ease in his society, as never once to
Wish for Weeds.

Among other singularities by which he was distinguished
From the rest of mankind,
It is worthy of being recorded, that several disorders,
Which prove fatal to others, were to him quite innoxious,
As he was well known to walk better for the Gravel, and
To thrive most in a habitual consumption.
At length,
Being unable to wheel his Barrow, or handle his Spade,
He was mowed down by the inexorable hand of death,
(Who strikes alike the Prince and the Parasite)
In the eighty-fourth year of his age,
Universally regretted;
For
He was upright in his dealings, faithful to his engagements,
And sincere in his friendship.

NATURAL CURIOSITY.—In July, 1832, there was growing on a Jargonelle pear tree in the neighbourhood of Lancaster, a monstrous production (Fig 36.) The sketch was taken and sent to us at the

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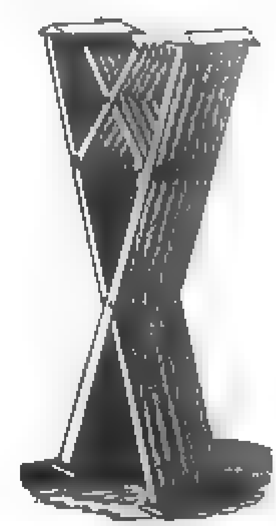
time by Mr. Saul. The first bloom appeared early in the spring, and produced a perfect fruit, from the eye of this pear another bloom was sent out, which produced another pear, and after this fruit had grown awhile, two more blossom buds issued from the eye, which expanded, set, produced two more pears, so that there were no less than three pears receiving support through the lowest fruit.

Also on the Alexander and Kirk's Emperor apple-trees, Mr. Saul had, the same season, fine double flowers, appearing at a distance like large double white roses, and measuring as much as three inches diameter. They were produced from the young shoots of the same season's growth; when the shoots had grown six inches long, and had formed four leaves, the flowers appeared.

Garden Seat.—The inclosed (fig. 37) is a sketch of a Garden Seat, which was exhibited at the Horticultural Society rooms, some time ago. I do not believe there is any thing very new in it, but it forms a very comfortable seat, is very portable, and is capable of being packed in a very small compass when not in use, or in bad weather. Fig. 37, is as it is used, and Fig. 38 in its compressed form.

37

38



Hatching the Eggs of Birds.—As the hatching of Eggs by the power of steam seems to be the order of the day, amongst a peculiar class of society connected with the Fowl trade, the following table taken from different authors by Count Morozzo, in a letter from him to Lacepede, may be interesting.

Names of Birds.	*Periods of their Incubation.*	*Duration of Life.*
Swan	42 days	About 200 Years.
Parrot	46 do.	— 100 do.
Goose	30 do.	— 80 or more.
Eagle	30 do.	Period of life not known.
Bustard	30 do.	
Duck	30 do.	
Turkey	30 do.	
Peacock	26 to 27	— 25 to 28.
Pheasant	20 to 25	— 18 to 20.
Crow	20	— 103 or more.
Nightingale	19 to 20	— 17 to 18.
Hen	18 to 19	— 16 to 18.
Pigeon	17 to 18	— 16 to 17.

The Crane, Heron, as well as Ostrich, hatch their Eggs chiefly by the heat of the Sun.

ARTICLE XII.—HORTICULTURAL CALENDAR.

Apples.—Gather the late ones on fine days. Mulch the trees removed last month.

Apricot Trees.—Draw the shreds from the small branches, after the manner of Peach and Nectarine trees.

Cherry Trees.—Prune and give them winter dressing. See Vol. 2.

Gooseberry and Currant Trees may now also be pruned.

Grapes.—Vines in pots brought into the Vinery will ripen fruit in April.

Peach and Nectarine Trees.—Draw the shreds from all the small branches, but keep the others fast nailed to prevent their being broken by the wind.

Planting may still be performed in the beginning of the month.

Raspberries and Strawberries in pots may be introduced into the forcing house.

FLOWER DEPARTMENT.

Auriculas in their winter quarters, must not be over-watered.

Camellias.—Introduce into the vinery as they are wanted to flower.

Chrysanthemums in Pots must have plenty of air.

Calceolarias, cut down in July will now be in full blow, keep them in an airy part of the greenhouse.

Dahlias should now be taken up, choose a fine day for the purpose.

Greenhouse Plants in general must be very carefully watered this month.

Forcing.—Introduce Pinks, Rhododendrons, &c. into gradual heat about the end.

Mignonette and Ten Week Stocks must have plenty of air, little water, and be preserved from frost.

Hyacinths should be planted in the beginning.

Roses in pots now brought into the forcing house, produce flowers in January.

Ranunculuses now planted in frames, will flower in March.

Tulips may now be planted.

VEGETABLE DEPARTMENT.

Asparagus beds should have their winter dressing.

Cauliflower plants in frames, must be exposed to the air, as much as possible.

Endive must be taken up, and blanched in a shed or frame, if the frosts are severe.

Raddishes now sown on a hotbed will come into use in February.

Sea-Cale should now be covered with pots for blanching.

Herbs in Pots should now be placed in the forcing house.

Rhubarb Roots may be taken up and plunged in heat.

T. HARDCASTLE, PRINTER, HIGH-STREET, SHEFFIELD.

THE HORTICULTURAL REGISTER,

DECEMBER 1ST, 1834.

ARTICLE I.

COLLECTIONS AND RECOLLECTIONS.

PROPAGATION OF DOUBLE STOCKS.—Slip off the side shoots in the early part of the summer; and having pared the lower part quite smooth with a sharp penknife, plant them in a mixture of light earth and sand, under a hand glass, and scarcely one will fail to grow.—*Irish Farmers' and Gardeners' Magazine.*

CULTURE OF THE TULIP.—Dig over the ground intended for the Tulip-bed about the end of July, or early in August, to the depth of two and a half or three feet. The ground best adapted is a fine rich loam, with a south exposure; and if the subsoil be clay, mix well with sea sand when digging, taking care to keep the upper stratum of the bed uppermost. If it be a light or gravelly subsoil, add some well mixed cow-dung and turf-mould in the bottom of the bed, until within about a foot of the surface. Dig over the bed again to the depth of eighteen inches, immediately before setting the bulbs, making the mould as fine as possible, and add some sand and decayed leaves, which have been previously well mixed in the proportion of three parts of sand to one of leaf-mould. The best time for planting is from the middle to the end of September, if the weather be dry; or any time from that until the middle of October, will produce a beautiful blow early in the spring.—*Irish Farmers' and Gardeners' Magazine.*

PLNTING TULIPS IN POTS.—Choose pots about eight inches in diameter, put a layer of two inches of common earth at the bottom, and another layer of 2 inches well mixed garden-earth, turf-mould, and cow-dung, in equal quantities, filling the pot with a compost of two parts of fine rich earth, and one part each of leaf-mould and sand, which has been previously well-mixed, and cover the bulbs to the depth of two and a half or three inches. The convenience and beauty of this

method of cultivation will be evident to all. Great care should be taken to raise the bulbs as soon as the flower-stalk and leaves begin to decay; and they should be kept in an airy situation, *not too dry,* until the time of planting.—*Irish Farmers' and Gardeners' Magazine.*

CULTURE OF THE PELARGONIUM.—When the object is to produce abundance of plants, or to cause the plants to grow in the greatest luxuriance, plant them in rich friable soil, in a sheltered sunny situation, in the open ground, in the beginning of May; they will soon push out shoots, which may be slipped off when two inches long, and each planted in a halfpenny pot, (thimble,) and placed in a moderate hotbed, and shaded, where they will strike directly. They should not have any air given to them for a week after they are put into the frame.

The slips may also be planted in the open ground, in a shady border, in June, July, or August, where not one in a hundred will fail to be rooted in a month after they are put in; they may then be potted in penny pots, (sixties,) and removed into the frames, green-house, or window of a dwelling-house. They must not be too much crowded, or they will lose their lower leaves and branches, and be "*drawn;*" neither must they have much water; a little may be occasionally given to such as appear dry, and abundance of air must be admitted every fine day. Pelargoniums are very impatient of frost; the frame must, therefore, be well secured by hay, straw, or mats. In March, let the plants be shifted into twopenny pots, (forty-eights,) using always the richest loam which can be procured, and from this time forward supply them with abundance of air, light, and water, and the flowers will amply recompense the trouble.

PRESERVING PELARGONIUMS THROUGH THE WINTER.—Those who have no other way of preserving them during the winter, may take the plants out of the border at the approach of frost in Autumn, and having shaken the earth from the roots, hang them up, head downwards, in a cellar, or other dark room, where they will be secure from frost. The leaves and shoots will become yellow and sickly; but on being planted out, the latter end of March, or as soon as the frost is over, will very soon recover their greatest luxuriance.

ANOTHER METHOD OF PRESERVING PELARGONIUMS.—Take off slips in September, and plant them in a mixture of three parts clean sand, and one part light loam, in a large pot. The pot should be better than half filled with gravel, or broken bits of pot, before the compost is put in; it may then be filled with slips or cuttings; and those at the margin of the pot, if not the whole of them, will readily

grow, and may be potted off or planted out in the spring. In this way, one hundred plants may be preserved in a single pot in a window.—*Irish Farmers' and Gardeners' Magazine.*

GEOGRAPHY OF PLANTS.—It is found convenient to divide the surface of the earth into different stations, when treating of Botanical Geography. The arrangements and distinctions of M. de Candolle are as follows:—

1. *Maritime or Saline Plants*: that is to say, those which, without being plunged in salt water, and floating on its surface, are nevertheless constrained to live in the vicinity of salt water, for the sake of absorbing what may be required for their nourishment. Among these, it is requisite to distinguish those which, like the Salicornia, grow in salt marshes, when they absorb saline principles, both by their leaves and roots, from those which, like the Roccella Fuciformis, exist upon rocks exposed to the sea air, and appear to absorb by their leaves only: and, finally, a third class, such as Eryngium Campestre, which do not require salt water, but which live on the sea-coast, as well as elsewhere, because their constitution is so robust, that they are not affected by the action of salt.

2. *Marine Plants*, also called *Phalassiophytes*, by M. Lamourouc, which live either plunged in salt water, or floating on its surface.

3. *Aquatic Plants*, living plunged in fresh water, either entirely immerged, as Confervœ; or floating on its surface, as Stratiotes; or fixed in the soil by their roots, with the foliage in the water, as several kinds of Potamogeton; or rooted in the soil, and either floating on the surface, as Nymphœa; or rising above it, as Alisma Plantago.

4. *Plants of Fresh-water Marshes*, and of very wet places, among which it is chiefly necessary to distinguish those of bogs, of marshy meadows, and of the banks of running streams; and, finally, those of places inundated in winter, but more or less dried up during the summer.

5. *Plants of Meadows and Pastures*, in the study of which, it is requisite to distinguish those that by their natural or artificial association form the turf of the meadow, and those others which grow mixed together with the greatest facility.

6. *Plants of cultivated Soil.* This class has been entirely produced by the agency of man: the plants which grow in cultivated lands are those which, in a wild state, preferred light substantial soils. Many have been transported from one country to another, with the seeds of other cultivated plants.

7. *The Plants of Rocks.* These pass, by insensible gradations, to those of walls, rocky and stony places, and even of gravel; and the

latter soil, as its fragments diminish in size, conduct us by degrees to the following class:

8. *Plants of Sands*, or very barren soil, in the classification of which much difficulty is experienced: thus, plants of the sand of the sea shore are confounded with saline plants; those of barren soil, with the species of cultivated land, and those of coarse sand are not different from those of gravel.

9. *Plants of sterile places*, that are very compact, as stiff clayey soils, or such as have their surface hardened by drought or heat, or those which are trodden hard by man or animals.

10. *Plants which follow Man.* These are few in number, and more fixed in their station, either in consequence of nitrous salts being necessary to their existence; or because, perhaps, azotised matter is requisite for their nutriment.

11. *Forest Plants*, among which are to be distinguished the trees that form the forest, and the herbs which grow beneath their shade. The latter are to be seperated into two kinds: those which can support a considerable degree of shade during all the year, which are found in evergreen woods; or such as require light in the winter, like those which are found among deciduous trees.

12. *Bushes and Hedge Plants.* The shrubs which compose this division differ from the plants of the forests in their smaller size, and by the thinness of their leaves. The herbaceous kinds that grow among them are ordinarily climbing plants.

13. *Subterranean Plants*, which live either in dark caverns, as the Byssus; or within the bosom of the earth, as the Truffle. These can dispense altogether with light, and several cannot even endure it. Plants that grow in the hollows of old trees have great analogy with those of caverns.

14. *Mountain Plants*, as subdivisions of which all the other stations may be taken. We generally class among mountain plants such as, in Europe, are not found lower thán five hundred yards; but this is quite an arbitrary limit. The most important division is between those which grow on mountains, the summit of which is covered with eternal snow, and those of mountains which lose their crest of snow in summer. In the former, the supply of water is not only continual, but more abundant and colder, as the heats of summer advance; in the latter, on the contrary, the supply of water ceases when it becomes most requisite. The former are evidently much more robust than the latter.

15. *Parasitical Plants;* that is to say, such as are either destitute of the power of pumping up their nourishment from the soil, or

of elaborating it completely; or as cannot exist without absorbing juices of other vegetables. These are found in all the preceding stations. They may be divided into, first, those which grow on the surface of others, as the Cuscuta and Misletoe; and, secondly, intestinal parasites, which are developed in the interior of living plants, and pierce the epidermis to make their appearance outwardly, such as the Uredo and Æcidium.

16. *Epiphytes*, or false parasites, which grow upon either dead or living vegetables, without deriving any nourishment from them. This class, which has often been confounded with the preceding, has two distinctly characterised divisions. The first which approaches true parasites, comprehends cryptogamous plants, the germs of which, probably carried to their stations by the very act of vegetation, develope themselves at the period when the plant, or that part where they lie, begins to die, then feed upon the substance of the plant during its mortal throes, and fatten upon it after its decease: such are Nemasporas, and many Sphœrias: these are *spurious intestinal parasites.* The second comprehends those vegetables, whether cryptogamic, such as lichens and Musci, or phanerogamous, as Epidendrums, which live upon living plants, without deriving any nutriment from them, but absorbing moisture from the surrounding atmosphere; these are *superficial false parasites*: many of them will grow upon rocks, dead trees or earth.—*Lindley's Introduction to Botany.*

ARTICLE II.

ANSWERS TO QUERIES, BY THE CONDUCTOR.

On the Size of Flower Pots.—To A. 3 page 42, and Gallenarus, p. 240. The sizes of Garden pots are as follows:—The smallest size are called thimbles, the next size 60s, which are 3½ inches deep, and 3½ wide at the top; 48s are 4½ inches deep, and 4½ wide at top, 32s 5½ in. deep, and 5½ wide at top; 24s 6½ in. deep, and 4½ wide at top; 16s 8 in. deep, and 7½ wide at top; 12s 8½ in. deep, and 8½ wide at top; 8s 9 in. deep, and 9 wide; 6s 10 in. deep, and 10 wide; 4s 11 in. deep, and 11 wide; 2s 12 in. deep, and 12 wide. It must be remembered, that these dimensions vary more or less in the formation of what are called *flats* and *uprights*, the former are of greater diameter than depth, the latter of greater depth than diameter, and these variations are considerable at the different potteries, but all are made to contain nearly the same portion of soil.

Brown St. Germain Pear.—To an "Enquirer," page 42, the

Pear of that name, mentioned in the "Encyclopedia of Gardening," is described by Forsyth, in his Treatise on Fruit Trees, p. 138, and appears to be identical with the Louise Bonne of Jersey, No. 419, of the Horticultural Society's Catalogue, which kind is not noticed by Lindley in his Guide to the Orchard, &c."

RIPENING OF MELONS.—To a "Young Grower," p. 42, the Kiesery Melon usually ripens nearly a fortnight before the Ispahan; it will, therefore, be necessary, in order to have the fruit ripe at one time, to grow them in two separate frames, and start the Ispahan a month sooner than the other. The "Perfect Melon," I am not acquainted with.

MANURE FOR GRAVELLY SOIL.—To "S. C." page 91, probably one of the cheapest as well as the best manure for very gravelly soils is the cleanings of ditches, or any strong loamy soil, which may be thrown into the farm yard, and exposed to the cattle, where it can be well mixed with manure water.

TANNERS' BARK, is by no means a lasting manure, and in many cases nearly useless; for stiff soils, however, it may be used with advantage, and as a top-dressing for grass land in the spring. It must be remembered that whenever much old tan is laid on the ground the wireworm nearly always becomes numerous. How salt would act, I cannot tell, having never used it myself, or seen it used by any other person.

STRAW MANURE.—The best mode of proceeding with rubbish-like straw would be to use it for bedding down cattle, or to throw it in the farm yard, where it would be mixed with manure water, and soon rot.

CROW FOOTS, are large iron bars, used as levers for various purposes, it is very possible they might be pointed at the top, and by being driven into the ground, they were liable to lame the persons who fell over them in their nocturnal depredations.

STRONG TOBACCO WATER.—The best tobacco water is to be purchased at the Tobacconist's, at a cheap rate, about 6d or 8d per gallon; if it is not convenient to obtain this, add to one pound of coarse shag tobacco four gallons of boiling water, and place it where the water will continue to be warm for some time, until the whole strength is extracted from the tobacco.

PLANTS THAT WILL GROW UNDER TREES.—The Butcher's Broom *(Ruscus aculeatus)* the Periwinkle, *(Vinca major and minor)* and many of the fern tribe, will grow under trees with great freedom, and the periwinkle luxuriantly.

GOOSEBERRY CUTTINGS.—Are not injurious to young Hollies, as mentioned by T. Butler, p. 138.

PRUNING NUT TREES.—To "X." p. 138, and 409, an Article on the subject will appear shortly:

QUALITY OF GRAPES.—Page 180, the character and quality of the *Esperione Grape* are as follows:—*Bunches* handsomely shouldered, and differing little in size from the black Hamburgh. *Berries* varying much in form; being sometimes round, frequently flat-rotund, and indented on the head, with the remains of the style. A groove or channel is often observed on one side or both, decreasing from the head downwards. *Skin* of a deep purple colour, inclining to black, covered with a thick blue bloom. The *Flesh* adheres to the skin, and though neither high-flavoured nor melting is pleasant. The leaves are variously cut, and die upon the tree of an orange hue. It is very prolific, very hardy, and of most luxuriant growth, perfecting its fruit equally well and early with the Sweet Water and Muscadine, and in unfavourable seasons has a decided advantage, over these and any other hardy grape. The *D'Arboyce* or *Royal Muscadine* is a white grape, the *bunches* are large, with middling sized shoulder *berries* of a moderate size, round, white, when ripe turning to an amber colour, having a thin skin, a soft flesh, and a rich vinous juice.* This will either do in a vinery or on the open wall; it is a very prolific bearer.

PEARS.—To "T. Butler," p. 186, the Qualities and Character of the *Verlaine Pear*, I cannot give, not being acquainted with it; the *Delices d'Hardenpont* is above the middle size, with a small eye, the skin of a pale yellow, with russety dots, with whitish flesh, rather gritty, but with good flavour, coming into use in November, and of the best quality for table; it will thrive as a standard, but bears the best against a wall. The *Colmar Epineur* is an excellent table pear of the very finest quality, coming into use in December: The trees seldom canker, and are great bearers, either as standards or against an east or south-east wall. The *Belle de Jersey* is an excellent pear for kitchen purposes, grows to a large size, ripens about Christmas. The *Colmar Josephine*, I believe to be a good fruit, but I cannot speak from my own experience.

APPLE TREES.—To "T. Butler," p. 186, the pipes seldom or rarely produce fruit like the Apple where they were extracted. In planting both sides of a wall, I recommend placing them alternate in preference to being opposite, as in the latter case the roots are apt to interfere too much with each other. Any fruit trees will suffer from being planted too near strong shrubs, if the roots of the shrubs mingle with those of the fruit trees.

* Lindley's Guide.

Cœsarian Cale.—To "J. M. Taylor." Sow the seeds any time from the middle of August to the beginning of September, in a light rich loam, and plant out two different crops, the first not later than the beginning of November, and the second towards the end of February. The proper distance betwixt plant and plant, is three feet. The soil should be strong rich loam, well manured. Towards May, the under leaves are stripped off for use, and are considered when the plants are grown on good ground, rather profitable food for cattle. It is not, however, sufficiently hardy, to prove a profitable crop for the farmers of the Country.

Melons.—To "H. G. C." the *Striped Housainee Melon* emits very little scent, when ripe, but changes to a golden colour beneath the netting. The kind called *William the fourth,* I have not seen, but have heard it is a very good one.

Plumieria rubra p. 408.—This beautiful stove plant succeeds best in rich light loam, and requires but very little water at any time, but it must be kept very dry when not in a growing state, which will have a tendency to throw it into flower. It is propagated by cuttings, which should be laid to dry for a while, like those of Cacti, and afterwards either struck in the tan or planted in pots.

Oxalis crenata.—To "G. E. J." p. 486. Tubers of this species should be planted singly, in small pots, early in April, and placed in a peach house, or any other place where a moderate temperature is kept, until they have grown a little, and when all danger of frost is over, they should be planted in a light garden soil about three feet apart. When they have grown sufficiently to admit of earth being added to their stems, it should be done as soon as possible, for the stems throw out roots into the ridges of earth, where the best, and not unfrequently the only tubers are formed.

Forcing Asparagus.—To "G. E. J." p. 487. An Article on the subject, with engravings, is in preparation, which will illustrate the system far better than words can do it.

Culture of Geraniums.—To Geranium, p. 488. Potting will prevent their flowering, untill the pots are filled again with roots. Pots of a proportionate small size are better than large pots, for inducing the plants to flower, pots 3 inches deep and wide (60s) are too small for the purpose. Either the ends of the shoots or lengths of the half-ripened stalks will do for cuttings. To renovate old plants, cut them down and repot them in March, and by the following Autumn they will be fine plants. The compost should be light and rich. An Article will shortly appear on the subject.

ARTICLE III.—HORTICULTURAL CALENDAR FOR DECEMBER.

Apple Trees against walls may be pruned, and newly planted ones mulched.

Cherry Trees in tubs, now placed in the Forcing house, will ripen their fruit in April.

Fig Trees on the open wall must be protected with mats. Those in pots or tubs, now introduced into the forcing house, will ripen fruit in April.

Gooseberry and Currant Trees should now be pruned.

Grapes.—Vines in pots, now brought into the vinery, will ripen fruit in April.

Peach and Nectarine Trees should have all their small branches unloosed: and the earliest Peach houses should be closed about the middle of the month.

Raspberries in pots, introduced into the forcing house at the end of the month, will produce fruit in April.

Strawberries in Pots, now introduced, will produce fruit towards the end of March.

FLOWER DEPARTMENT.

Tender Azaleas, in increased temperature, will now be in flower.

Auriculas and Polyanthuses must be well secured from frost.

Camellias may be introduced into an increased temperature, to bring them into flower.

Chrysanthemums in pots now in flower, must have plenty of air.

Calceolarias may some of them possibly require potting.

Cyclamen persicum must now be removed into a little heat, until they show flower, and then to the situations where they are intended to bloom.

Dahlia roots must be kept dry.

Greenhouse Plants must be very carefully watered, and have plenty of air.

Forcing.—Roses, now introduced, will produce flowers in February, also Pinks, Carnations, &c., may now be forced.

Mignonette in frames must have plenty of air, but be preserved from frost.

Tulip beds must be sheltered from heavy rains.

VEGETABLE DEPARTMENT.

Asparagus.—Plant on hotbeds for forcing.

Cauliflower Plants, in frames, must have plenty of air.

Radishes, now sown on a hotbed, will be fit to draw in February.

Herbs in pots introduce into the forcing house.

Sea Cale must now be covered with pots and dung.

FLORICULTURE.

ARTICLE IV.—NEW AND RARE PLANTS,

FIGURED IN THE PERIODICALS FOR NOVEMBER.

CLASS I. PLANTS HAVING TWO COTYLEDONES (DYCOTYLEDONES.)

SCROPHULARINEÆ.

CALCEOLARIA CRENATIFLORA *Knypersliensis*, Knypersley Slipperwort.—This fine variety is a hybrid offspring between C. crenatiflora and atrosanguinea, and was raised by Mr. P. N. Don, at Knypersley Hall, Staffordshire, the seat of James Bateman, Esq. It grows well in a mixture of leaf mould and sand, and like the rest of the species it loves shade. It can only be increased by slips. The flowers are bright yellow, with a large patch of chocolate brown on the lower lip.—*See Brit. Fl. Gard.* 262.

MIMULUS LUTEUS *Youngana*, Mr. Young's Monkey Flower.—This is a beautiful variety of the *lutea* greatly resembling the M. Smithii. The corolla is of a rich full yellow, and every segment marked with a blotch of rich red-brown inclining to blood colour. It is perfectly hardy.—*Bot. Mag.* 3363.

BOMBACEÆ.

ERIDODENDRON ANFRACTUOSUM *Caribænum*: Five-Stammed Silk-Cotton Tree, Caribean Variety.—An elegant as well as singular looking tree, of which the present variety is a native of the West Indies, but cultivated in Madeira, where it rises with a clear, straight, slender stem to a considerable height, and then throws out somewhat distant spreading or nearly horizontal branches, which, like the stem in young trees, are covered with a shining, smooth, green bark; this, however, soon becomes grayish, and almost hidden by very large, and remarkable prickles. Flowers of a delicate pale primrose, or cream colour, streaked with deep purplish red.—*Bot. Mag.* 3360.

ONAGRARIÆ.

ŒNOTHERA DRUMMONDI, Mr. Drummond's Evening Primrose.—The present is one of two Œnotheras; of which seeds were transmitted from Bragosia by Mr. Drummond, the Assistant-Naturalist in Capt. Sir John Franklin's over-land expedition. In size and colour the blossoms of this species, vie with those of Œnothera macrocarpa, Missouriensis, and Grandiflora, but in other respects differs considerably from them. It flourishes in the open air though a native of Texas.—*Bot. Mag.* 3361.

SOLANEÆ.

SALPIGLOSSIS STRAMINEA *picta*, Straw-coloured Salpiglossis, Painted variety.—That this elegant plant is a mere variety of S.

strammia, no one can reasonably entertain a doubt who has been in the habit of cultivating that variable plant, and seen how much individuals raised from seed are liable to sport. Mr. Neil first reared this very elegant variety at Cannon-Mills, near Edinburgh.—*Bot. Mag.* 3365

LEGUMINOSÆ.

ACACIA PLUMOSA, Feathery Acacia. —A most elegant climbing shrub, the foliage of which is most delicate and lovely, the leaves resembling gracefully curved or drooping plumes of feathers of a bright yellow-green colour.—*Bot. Mag.* 3366.

KENNEDYA NIGRICANS, Dingy-flowered Kennedya.—A fine addition to the greenhouse twiners; native of New Holland, where its seeds were collected by Dr. Nisbet. It is very near K. rubicundi, from which it differs in the remarkable colour of the petals, which are a very dark purple with a greenish yellow blotch. It flowers in April. —*Bot. Reg.* 1715.

ERICEÆ.

AZALEA INDICA *variegate*, Variegated Chinese Azalea.—This is the celebrated variegated Chinese Azalea, which so many attempts have been made in vain for these twenty years to procure alive. It was brought home by Mr. M'Killigan in 1832, and is now in the possession of Mr. Knight, of the King's Road. The flowers are white, beautifully striped, and variegated with bright rose colour.—*Bot. Reg.* 1716.

CACTEÆ

ECHINOCACTUS OXYGONUS, Sharp-angled spring Cactus.—This species is in the possession of Mr. F. Mackie, Nurseryman, &c. Norwich, who received it along with a large number of other rare and valuable succulent plants belonging to the unrivalled collection of Mr. Hitchen. The flowers are nearly a foot long, and of a light rose colour.—*Bot. Reg.* 1717.

PHILADELPHEÆ.

DENTZIA SCABRA, Rough-leaved Dentzia.—A new hardy shrub, white flowers, native of the Fakon mountains and neighbouring parts of Japan. For this most interesting addition to our gardens, we are indebted to John Reeves, Esq. who imported it in 1833.—*Bot. Reg.* 1718.

PITTOSPOREÆ.

BILLARDIERA OVALIS, Oval-leaved Billardiera.—A native of Van Dieman's Land, whence it was introduced by Mr. Lowe, of Clapton. Its flowers change from greenish yellow to dark purple, and appear in May. It is probable that it will be quite hardy enough to live in

this country, trained to a west wall, if protected from wet in winter; at all events a cold pit would be ample covering for it, and for all the other species.—*Bot. Reg.* 1719.

MALVOCEÆ.

MALOPE TRIFIDA *grandiflora*, Great-flowered Trifid-leaved Malope.—This new and beautiful annual we believe to be a variety of M. trifida. The flowers are far more showy than the trifida, and the plant well deserves extensive cultivation. It is readily increased by seeds which merely require sowing in the open border, about the beginning, and until the middle of April. It will flower considerably sooner, if the seed be sown in pots and transplanted, and afterwards turned out into the borders after the manner of half hardy annuals. *Paxton's Mag. of Bot.* 177.

RANUNCULACEÆ.

PŒONIA EDULIS *Reevesiana*, Mr. Reeve's Pœony.—This splendid herbaceous Pœony, was introduced from China by Mr. Reeves, to whom our country is indebted for many other Chinese rare plants. The kind is in the possession of Mr. Tate, of Sloane-Street, who has several other unique things from the same quarter of the World.—*Paxton's Mag. of Bot.* 197.

ROSACEÆ,

CRATŒGUS OXYACANTHA *rosea superba*, Deep rose coloured Flowering Hawthorn.—We have long had the common Scarlet flowering Hawthorn in our shrubberies; and many of the wild ones, like the double white variety, may be seen to die off with a blush tint. But the present subject is much more deeply vivid rose colour than any other, and no less conspicuous in this respect than admired for the profusion and elegant disposition of its corymbs of flowers, along the upper sides of the branches, forming perfect garlands. Mr. Malcolm, Nurseryman, Kensington, has a fine assortment of both standards and dwarfs of this beautiful kind for sale. It is propagated by working on the common thorn.—*Paxton's Mag. of Bot.* 198.

COMPOSITÆ.

ZINNIA VIOLACEA *coccinea*, Violet coloured Zinnia, Scarlet variety.—Seeds of this beautiful Zinnia were brought amongst many other things from Palermo, by His Grace the Duke of Devonshire. It far surpasses any other species. All the plants of this genus are annuals, and are cultivated with the greatest ease, when treated as half hardy. The seeds require to be sown on a hotbed in March, as recommended for other half hardy annuals, and by the end of May, or when the spring frosts are over, may be transplanted into the open borders, or placed in pots, at the option of the cultivator. The soil is a light rich loam.—*Paxton's Mag. of Bot.* 223.

GESNEREÆ.

Gesneria Cooperi, Mr. Cooper's Gesneria.—This elegant species was sent to the late Mrs. Arnold Harrison, with other varieties, by her brother, from Brazil, about five years ago. The best soil for it, is sandy loam and peat. It is easily propagated by cuttings, planted in sand or mould plunged in heat, and covered with a bell glass. It also produces plenty of seeds.—*Paxton's Mag. of Bot.* 224.

CLASS II.

PLANTS WITH ONLY ONE COTYLEDONE (MONOCTYLEDONES.)

AMARYLLIDEÆ.

Alstrœmeria pelegrina *alba*, Spotted flowered Alströmeria, White variety.—This is a very handsome variety. The roots of all the species of this splendid genus abound in a nutritive fœcular which may be prepared for food: the natives of Chili obtain from the roots of one of the species a substance resembling arrow-root.—*Paxton's Mag. of Bot.* 199.

ORCHIDIÆ.

Batemannia Collegi, Colley's Batemannia.—Sent from Demarara to James Bateman, Esq. by Mr. Colley, his collector in that country, who has just returned from a successful mission with a considerable number of epiphytes, which are new to our gardens. The flowers are red, white, and purple.—*Bot. Reg.* 1714.

ARTICLE V.—LONDON HORTICULTURAL SOCIETY.

Notwithstanding the desertion of the Metropolis at this season, Horticulture and Botany have been sufficiently attractive to draw together a tolerable attendance of visitors at the exhibitions which we are about to record. In consequence of the advanced period of the year, however, a comparison will not bear being made between them and those which have already taken place, marked, as they were, by such eminent success, both in regard to the patronage which was afforded to them, and the general splendour of the different collections brought into competition. At the exhibition in the Society's Garden, on the 13th of September, the number of contributors was very great, particularly of Dahlias. In this class of flowers, the skill of Messrs. Glenny, Brown, and Widnall, was very apparent, their nurseries having yielded the choicest imaginable, both in form and colour. The selections of Messrs. Brewer, of Cambridge; Wilmer, of Sunbury; and Girling, of Stowmarket, were also very good. The fruit was in greater quantity than before, and was remarkably fine, especially the Grapes, Pine Apples, and

Melons, which were very superb, and in the highest condition. In this department, Mr. Dowding, gardener to Lady Clarke, again carried off the first gold medal, of which he was truly deserving. Some excellent orchideous plants in flower, specimens of Corylus Colurna, and large collections of miscellaneous plants, were interspersed, and rendered the *coup d'œil* very beautiful. The Judges, after the most mature deliberation, disposed of the prizes as follows:

THE GOLD BANKSIAN MEDAL.—1. Mr. C. Dowding, Gardener to Lady Clarke, for miscellaneous Fruit. 2. Mr. Redding, Gardener to Mrs. Marryat, F. H. S. for miscellaneous Plants. 3. Mr. C. Brown, F. H. S., for a collection of 100 Dahlias. 4. Mr. Glenny, F. H. S., for a collection of 100 Dahlias.

THE LARGE SILVER MEDAL.—1. Mr. Atlee, Gardener to T. Farmer, Esq., F. H. S., for Grapes. 2. Mr. R. Buck, F. H. S., of Blackheath, for Muscat Grapes; 3. Mr. Fletcher, Gardener to Geo. Smith, Esq. for a Queen Pine. 4. Mr. William Bridden, Gardener to Mrs. Myddleton Biddulph, for a New Providence Pine. 5. Mr. J. Loudon, Gardener to Samuel Gurney, Esq., F. H. S., for green-fleshed Melons. 6. Mr. William Lindsay, Gardener to the Duke of Devonshire, F. H. S., for Gansell's Bergamot Pears. 7. Mr. Jarvis, of Turnham-green, for Beurrée Diel Pears. 8. Mr. Jos. Kirke, F. H. S., for a collection of Apples. 9. Mr. Upright, of Morden, for miscellaneous Plants. 10. Mr. Geo. Mills, F. H. S., for miscellaneous Plants. 11. Messrs. Rollisson, of Tooting, for Epidendrum Cuspidatum. 12. Mr. Stephen Hooker, F. H. S., for China and perpetual Roses. 13. Messrs. Rollisson, for miscellaneous Roses. 14. Mr. Widnall, of Cambridge, for a collection of 100 Dahlias. 15. Mr. Gaines, of Surrey-lane, Battersea, for a collection of 100 Dahlias. 16. Mr. C. Brown, of Slough, F. H. S., for a collection of 25 Dahlias. 17. Mr. Widnall, of Cambridge, for a collection of 25 Dahlias.

THE SILVER BANKSIAN MEDAL.—1. Mr. Clews, F. H. S., for Black Hamburgh Grapes. 2. Mr. Spong, Gardener to Robert Gordon, Esq., M. P., F. H. S., for Melons. 3. Mr. Jarvis, of Turnham-green, for Apples. 4. Mr. Boone, Gardener to S. Warner, Esq., F. H. S., for Citrons. 5. Mr. Cuthill, Gardener to Laurence Sullivan, Esq., F. H. S., for Cucumbers. 6. George Robins, Esq., F. H. S., for Yucca aloifolia. 7. Mr. Spence, Gardener to R. Durant, Esq., F. H. S., for Brugmansia arborea. 8. Mr. Mountjoy, of Ealing, for Heartsease. 9. Mr. C. Brown, of Slough, F. H. S., for miscellaneous Heartsease. 10. Mr. Rivers, of Saw-

bridgeworth, for China Asters. 11. Mr. Brewer, of Cambridge, for seedling Dahlias. 12. Mr. Henderson, Gardener to Capt. Foster, F. H. S., for seedling Dahlias. 13. Mr. Wilmer, of Sunbury, for 25 varieties of Dahlia. 14. Mr. Maher, of Fifield, Berks, for 25 varieties of Dahlia. 15. Mr. Catleugh, of Hans-street, Sloane-street, for a collection of 100 Dahlias, in Pots.

At the ordinary meetings, papers have been read, on the cultivation, &c. of the Chasselas Musqué Grape, and on the propagation of Pinks and Carnations, without the aid of glass; and the following subjects have formed portions of the exhibitions: A specimen of the fragrant Lichen Chroolepus Iolithus, presented by Sir Augustus Foster, Bart.; fine specimens of the Double-bearing Raspberry, from Mr. Joseph Kirke; Beurré Diel Pears, 20 oz. each, from Lord Farnborough; Ickworth Imperatrice, and Dunmore Plums, from T. A. Knight, Esq.; many very fine exotics; and Apples, from E. G. Barnard, Esq. M. P.; the names and average weight of which were the Alexander, 17 oz.; Shepherd's Fame, 12 oz.; Hollandbury, 14 oz.; King of the Pippins, 10 oz.; Coster, 17 oz.; Seek-no-further, 18¼ oz.

NORTH DEVON HORTICULTURAL SOCIETY.

The sixth exhibition of the above Society took place at the Public Rooms, in this town, on Wednesday, June 4th. The weather proving very unfavourable for the occasion, as heavy rain fell during the whole of the morning, the town had not that appearance of gaiety which no doubt it would have presented under a sunny sky, when the fashionable attractions of the day would have been more conspicuous. The interest which the resident and neighbouring gentry evidently feel in the advancement of the Society, which we believe has already improved beyond the most sanguine expectations of its supporters and the public generally, was sufficient, notwithstanding the inconvenience they must have experienced, to collect a large and highly respectable assemblage of both sexes. The Rooms, indeed, were filled within a very few minutes after the opening of the doors; and although the rain without poured down in torrents, the scene within was of the most animated description. A considerable deal of taste was manifested in decorating the lobby, stairs, &c. with evergreens, and in the other arrangements, under the superintendance of Mr. James Baker. A scarcity of flowers, especially the Dahlia, so useful in ornamental work, precluded the possibility of so rich a display in this respect as we may anticipate at a future exhibition; but there was no want of ability or industry to supply the

deficiency; and, independent of two neat stars, composed of various flowers, we observed a large crown, festooned over, formed of evergreens, and W. IV. in large characters, worked in with white stocks. The centre stand and benches, containing cactuses, anemones, amaryllas, geraniums, balsams, exotics, all in infinite variety, (many of which were of the most rare and beautiful descriptions,) prize vegetables, &c. &c. were admirably set out. We noticed two very superb plants, the cactus speciocissimus, and two or three of the cactus speciosa, the most brilliant we have ever seen, belonging to R. W. Grace, Esq. of this town. E. R. Roberts, Esq. contributed a splendid show of balsams, which obtained the first prize; a beautiful orange tree, with fruit in great perfection; the petunia integraflora; a vast assortment of geraniums, among which was one of a very favourite kind, called the Sir Walter Scott; and also a bouquet of hardy herbaceous flowers. Mr. Bale, of Westacott, had a rich variety of American plants; the first prize in geraniums; a very handsome yellow noisette rose; some large and elegant bouquets of flowers; and two dahlias, in pots, the only ones in the room. We might, if our limits permitted, go on enumerating similar productions from other gentlemen in the neighbourhood; but as they will be found in the list of prizes, it is not necessary to detail them here. The fruit table merits a great share of approbation, being supplied with some of the finest that can be imagined; a vine, with a large quantity of grapes on it, the property of the Rev. J. L. Harding, and growing in a pot, was much and generally admired. The bouquet named in the list of prizes, for which the Rev. C. Mules, of Muddiford, obtained the first prize, contained one hundred different sorts of flowers; and the same gentleman sent cabbages, not intended for competition, weighing above 20lbs. each.

We should not omit to mention, in justice to the individuals themselves, and in proof of the increasing importance of this Society, the contributions of respectable nurserymen from distant places. From the nursery of Messrs. Lucombe and Pince, Exeter, Mr. Nott attended with a very rare and valuable selection of flowers, &c.; among which we discovered the gesnereia maculata, very scarce; calanthe veratifolia, rare and exceedingly beautiful; alstræmmeria pulchello, ditto tricolour, ditto pelegrina; new seedland delpheniums, very fine; ismene calathina, a beautiful sweet-scented bulbous rooted plant; epidendrum cochleatum, a choice and rare parasytical plant; new seedling sweet-scented amaryllas, very splendid, a collection of heartsease, containing upwards of one hundred varieties; about twenty-five new seedling geraniums, many of them surpassing

anything of the kind we have ever seen, besides a superb collection of geraniums, of known cultivated sorts, which gained the first prize; fifty distinct sorts of calcolaria, which gained the first prize; an erica elegans, beautifully grown, and very fine; a pure white rhododendrum albidum; this is a rare plant, and has never before flowered in this part of the country; a collection of roses, among them a yellow noisette, white moss, scarlet moss, &c.; also a handsome new climbing plant, called the tropœolum tricolorum. Mr. Pontey, of Plymouth, exhibited a splendid collection of Turkey ranunculuses, and a fine specimen of alstræmeria aurantiaca, which is uncommonly beautiful, and deserves the attention of every cultivator of plants. A great variety of geraniums were also sent by Mr. Rendle, of Plymouth, which were of the most beautiful description; many of them, we understand, were never, before this season, exhibited in England; but as they were not entered for a prize, by the desire of Mr. Rendle, who did not attend, none were of course awarded to him, though well deserving of it.

The room usually occupied by the cottagers was by no means so crowded as on former occasions. The early state of the season, however, accounts for this. The ensuing exhibition, which we have heard is intended to take place at the latter end of July or beginning of August, will most probably be one of vast abundance.

The party having promenaded the Rooms until two o'clock, enjoying the rich treat afforded them in viewing the exhibition, and enlivened by music from a band stationed in the orchestra, the Rev. Mr. Dene, who had been solicited to discharge the presidential duties, declared the prizes, and briefly addressed the company, congratulating them on the prosperous state of the Society, and the very gratifying prospects held out, by increased subscriptions, that it will ere long have a distinguished place in the horticultural annals of the country.

ROYAL CORNWALL HORTICULTURAL SOCIETY.

On Wednesday, Oct. 22, the eleventh exhibition of this Society, being the last for the season, took place in the Assembly Rooms, Truro, and we have pleasure in remarking that the attendance of subscribers and their friends was as numerous as ever. Among the company present were the Earl of Falmouth, Sir Charles Lemon, Bart., M. P., David, Gilbert, Esq., J. S. Enys, Esq., &c. &c. The display of fruits and flowers gave great satisfaction, and a band of music occupied the gallery as usual, and played some favourite

airs. At two o'clock, the President, Lord Boscawen Rose, took the chair, and addressed the company as follows:

Ladies and Gentlemen,—In opening the business of the present meeting, I trust that a few observations on this day's exhibition will not be deemed irrelevant on my part. The show, both of flowers and fruit, though not large, is, I will venture to say, a very superior one, as regards the quality of the specimens exhibited for the present late season of the year. In the cottagers' department especially, there is abundant evidence of an increased attention to horticulture, afforded by the excellence of the articles produced. (Cheers.) Of this I am particularly glad, as I shall always consider the encouragement of gardening among the poorer classes, if not the principal object of this Society, at least one of paramount utility. (Hear.) And here let me express my regret that the most excellent treatise, entitled "The Cottager's Manual," and prepared by the kindness of Mr. Booth, appears to be as yet but little generally known throughout the county. (Hear, hear.) Its more general distribution by the rich among their poorer neighbours would, I am persuaded, tend to the formation, in every district, of those Rural Societies, which, where they have been tried, have been found so beneficial. In fact, they afford the only sure means of ascertaining that the articles exhibited by a cottager are *bona fide* the produce of his own garden. It is extremely difficult, at the periodical meetings of this Society, to prevent unfair dealing in this respect; and I am sorry to say, that in one or two instances frauds have already been detected. I trust, however, that the means taken to discountenance such practices may prove effectual for their prevention in future; and I am sure, that were District Societies more general, there would be no further cause of complaint on this account. (Hear)!

To turn from an unpleasing subject—I have now to return the best thanks of the Society to a lady whose labours in its service have been beyond all praise.—The *Hortus Siccus* now before me, and which has, through her goodness become our property, is at once a monument of her indefatigable research in collection, and scientific knowledge in arrangement of the indigenous plants of this County.—I allude to Miss Warren; and I feel sure of the cordial concurrence of all present, when I return her, our most sincere thanks for her invaluable gift. (Cheers.)

To all those who have contributed to this day's show, our thanks are also due.—Among the most beautiful Plants exhibited, I have to remark a fine specimen of the *Amaryllis* from the garden of Mr. M. Williams; also two of the *Passion-Flower*, from that of Mr. Daubuz,

and some Stove Plants from that of Sir Charles Lemon, who never fails to furnish us with some proof of his superior taste in Horticulture. (Cheers)—Amongst the Dahlias, those which have gained the first prize will be found well worthy of attention, as also a new Seedling, grown by Mr. Daubuz's gardener.—There is one more subject to which I beg leave to call your attention before I conclude.—I very much question whether it would not be better to reduce the number of our Exhibitions; or at any rate, not to have one so late in the year, as at this season.—I mention this with the greatest possible deference to the opinion of the Society, nor should I have introduced the subject at all, but this is the last occasion on which I shall have an opportunity of addressing you before the next General Meeting, and I think it highly desirable that this point should be well considered in the interval, in order that Members may be prepared to meet any suggestion which may be then thrown out, with a view to a better arrangement.

I will now conclude by returning my best thanks to the Ladies who have been kind enough this day to grace our Exhibition by their presence, and by requesting the Secretary to read to you the the list of Prizes. (Cheers.)

The Secretary, Lieut. Pooley, R. N., proceeded to read the lists.

The collection of Fruit contained many excellent specimens. Among the Pines we remarked a very handsome fruit of the *Smooth Havannah* from L. C. Daubuz, Esq. There was a large assortment of out-door and hot-house Grapes, and also of Pears and Apples, all of which showed great judgment in their selection; the size and beauty of many of the dishes, including those of Walnuts, excited general admiration.

WORCESTERSHIRE HORTICULTURAL SOCIETY.

Rather singularly, St. Swithin was appointed to the charge of the fourth floral exhibition, and though we should have felt it somewhat hazardous to have depended on such patronage, the event proved propitious in no ordinary degree. No exhibition during the present year has been so attractive or attended by such a throng of beauty and fashion, while the brilliancy of the weather drew forth a continued stream of gay visitors, "thick as leaves in Vallambrosa." We are always pleased with the appearance of novelty and ingenuity, and this was effectively displayed in a lofty garland of flowers of all hues arranged in the form of a vase surmounted with an imperial crown, which attracted the attention of every eye on entering the room. This plea-

sing addition to the attractions of the Exhibition was sent from Mr. Tapp's. Some singularly fine plants graced the stands from various private spirited individuals, in addition to the array from Messrs. Smith and Tapp; and it is with great pleasure that we notice these, because without the support of the gentlemen of the county, and those individuals who, at a very considerable expence and trouble, without the possibility of adequate remuneration, send specimens from a considerable distance, the Exhibitions could not be carried on with spirit or satisfaction. That fine American shrub the *Clethra Arborea,* with its racemes of white lily-like flowers, from the Rev. Mr. Larden's of Doverdale Rectory, was a beautiful object to gaze upon, nor could we fail to be struck with the clusters of yellow blossoms displayed by the *Cactus Opuntia,* from Mrs. Turner's, the immense *Hydrangia hortensis,* from the same lady, and the waxlike clusters of the *Hoya Carnosa.* That singular fly-trap, the *Apocynum Androsæmifolium,* brought by Mr. Fuller, with the dipterous insects entrapped in its stamens, presented us with a curious exemplification of the economy of nature. On the whole we were much pleased to notice that one general sentiment of satisfaction pervaded the assemblage of friends and visitors of the Society: and the brilliant display of Carnations and Dahlias, with the tempting ambrosial scent emanating from the long table of Pines, Grapes, and numerous other Fruits, seemed to detain the company longer than usual. We observed that Mr. J. D. Wheeler, of Gloucester, attended with a very rich and unique display of Carnations.

The fifth and last Exhibition for the season took place at the Guildhall. We have rarely, if ever, seen so splendid a display of Dahlias as graced the stands of the Society, in all their gorgeous folds and numerous varieties. It is somewhat perplexing to attend two "Reviews" on the same day, but we were happy to observe many of the members of our fine corps of yeomanry and members also of Flora's troop were enabled to be present at both "inspections." Our gardeners appear recently to have been exerting their abilities in a fanciful way, and some very tastefully executed garlands and devices in dahlias and other flowers attested their skill upon the present occasion. There was a rich display of fruits, including pines, grapes, peaches, cherries, currants, and some very fine varieties of the apple and pear. Also melons and some gigantic gourds. Messrs. Smith and Tapp brought a profusion of plants, and the exhibitors from the general body of the Society were unusually numerous. We noticed some very fine German asters, those especially of Mr. G. Wilday, Mr. Gummery, and Mr. Bond, attracted the notice of the amateur

florists. Among so many plants worthy attention, it becomes almost impossible to enumerate all we could wish; but it would be unjust not to mention the magnificent *Yucca gloriosa,* and its noble spike of white flowers enriched by its rigid spears, brought by Mr. Fuller, and branch of *Magnolia grandiflora,* sent to the Exhibition by Moses Harper, Esq. So close was the competition, that the judges felt it necessary to create numerous honorary prizes, that the skilful competitors should not be altogether deprived of the distinction they deserved.

LONDON HORTICULTURAL SOCIETY.

PAPERS on certain facts connected with the propagation of Balsams by cuttings; on the use of Caoutchouc rings applied to the Flower buds of Pinks, Carnations, &c. and Observations on the Nice Cluster and Hock Grapes, and on the raising of Apples from Pips; have been read during the last Meetings. The communications being made by the Author of the Domestic Gardener's Manual; the Rev. E. H. Bond, and by John Williams, Esq. C. M. H. S. Among other ingenious purposes to which Indian rubber has lately been applied we now find it in the hands of the Florist to prevent the unsightly bursting of the buds of his favourite flowers, a use to which it is admirably adapted, since it can now be obtained in thin sheets, and with the aid of a punch the desired expansive ring is in a moment obtained. The exhibitions have contained many things of interest. Fine specimens of Oncidium ciliatum from B. Miller, Esq. of Mitcham, and Monachanthus discolor (a new and very curious orchideous plant from Demerara,) from James Bateman, Esq. F. H. S. were much admired. The first named was in perfect health and had 44 flowers on it. Scarlet Brazillian Pine Apples of 4½ and 5 lbs weight, from Mr. Robert Buck, F. H. S. A Gourd, 8 feet in circumference, and 212 lbs. in weight, from Lord Rodney, F. H. S. Ipomda rubro-cyanea, from Mrs. Marryat, F. H. S., Citrons; Shaddocks; Bark-leaves, and fruit of the Quercus alba, Q. ceris, and Q. suber; and samples of the ornamental tiles used by the Chinese. We also observed a collection of 28 varieties of Apple in excellent order from the Society's Garden. Those of the highest merit, were Pearson's Plate, the Golden Reinette, Reinette grise, Court of Wick, and Beachamwell.

ENTOMOLOGICAL SOCIETY.

J. G. CHILDREN, Esq. Sec. R. S., President, in the Chair. Various British and Foreign works upon Entomology were presented to the Society, and thanks ordered to be returned for the same to their respective donors. A letter was read from Mr. Johnson, of the Island of Grenada, acknowledging the arrival of the report of the committee appointed to investigate the ravages of the cane fly in that Island. The following papers were read; remarks on innumerable quantities of the dead bodies of Galerucca Tanaceti observed on the Coast of Lincolnshire, by W. H. Saunders, F. L. S. On the Tarsi of Insects, with reference to the superiority of the tarsel system of the coleoptera, and in opposition to the views of Mr. Mac Leay, by J. O. Westwood, F. L. S. &c.; Observations on the ravages of Limnoria terebrans, a minute crustaceous animal, allied to the woodlice, upon the piles, &c. of marine erections, with the suggestion of remedies against the same, by the Rev. F. W. Hope, F. R. S., &c,;—Specimens of wood attacked by the insects, as well as of the insects were exhibited.

Mr. Westwood communicated an account of the injuries done to barley and turnips by several species of insects which were exhibited, belonging to the *Choœnon* and *Eucoila,* as well as the pupa of a depterous insect, which, from its destructive habits, it was feared might prove to be the *Musca Frit,* which according to Linnæus, annually destroys one-tenth of the crops of barley in Sweden.—Mr. R. H. Lewis exhibited some living specimens of beetles captured by himself in North America, nine weeks since, and which he had preserved alive, without their having taken any food during that period.—A lengthened discussion on the various communications took place;—Mr. Yarrell suggested, that the situation of piles and other marine wood-work with a solution of corrosive sublimate, might, by the formation of a new compound of the vegetable juices with the corrosive sublimate, as effectually prevent the attacks of insects as the not less injurious ravages of the dry rot, or other causes of decay.

The first Part of the Society's Transactions was announced as ready for delivery.

LIST OF CONTRIBUTORS TO VOL. III.

LIST OF BOOKS REVIEWED AND OTHERWISE NOTICED IN THE VOLUME.

LIST OF ENGRAVINGS.

LIST OF NEW AND RARE PLANTS NOTICED IN THE THIRD VOLUME.

ABBREVIATIONS.

f a, Frame Annual
f b, ——— Biennial
f p, ——— Perennial
f s, ——— Shrub
g a, Greenhouse Annual
g b, ——— Biennial
g p, ——— Perennial
g s, ——— Shrub
h a, Hardy Annual
h b, ——— Biennial
h p, ——— Perennial
h s, ——— Shrub
s b, Stove Biennial
s p, ——— Perennial
s s, ——— Shrub
s o, ——— Orchidea

Hardy Plants are such as require no protection at all
Frame—such as require protecting from the severity of frost, &c.
Greenhouse—such as require more tender treatment.
Stove—requiring a strong heat to grow them to perfection.

Those marked *a* are the most beautiful.

GENERAL INDEX.

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ERRATA.

Page 1, Line 12 from top, for Forcing Plants read Flowering Plants.
25,........ 2 ....Umbellati .... Umbellate
26,........13.... .bottom....seed .... seeds
39,........10......top ....acuminate .... acuminata
40,........ 4... .. ....Raminculaceæ.... Ranunculaceæ
41,........13......bottom...:Cirrhaæ .... Cirrhæa
43,........20......top ....Eriosomra .... Eriosoma
53,........ 4...... ....Bignomia. .... Bignonia,
....Rose Honeysuckle Rose, Honeysuckle
70,........20...... ....Heacy .... Heary
91,........10......bottom....Insert a semicolon after Aculeatus
....Penca Mayer and Menor, read Vinca major and minor
....Take out the parenthesis.
92,........14......top ....glaucopsis .... glaucopis
114.........11......bottom....Denyon .... Denyer
134,........12 .. .. Lushu .... Lushii
166,........9 ......top ....Rutgee .... Rutger
5 ......bottom....Cappee .... Capper
186,........8 ......top ....D'Arbyca .... D'Arbyce
10... .. ....Colman .... Colmar
13......bottom....Liger .... Tiger
187,........19... ..top ....Liger .... Tiger
188,........7 ......bottom....Ribesü .... Ribesii
10...... ....Kirkby .... Kirby
9 ....Spencer's .... Spence's
267,........15......top ....Gilliesu .... Gillieaii
14.... bottom....Douglasu .... Douglasii
268,........16...... ....gruneenensis .... guineensis
376,........9 ....Mori de Fumea .... Noir de Fumée
378,........10...... ....berds .... heads
379,........12......top ....heat .... heart
11......bottom... heating .... hearting
388,. ......15...... ....Campanulicieæ .... Campanulaceæ
398, add E. Murphy, at the end of the note.
410, Line 3 from bottom for Siceus .... Hortus Siccus
1 Siceus .... Siccus
439,........4 ... ..top ....for 1699 .... Tab. 1699
493,........2 ......bottom....neat .... much
19...... ....improlific .... unprolific